

Characterization of Emissions from Open Burning of Meals Ready-to-Eat and their Paperboard Packaging

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Executive Summary

Emissions from burning current and candidate Meals Ready-to-Eat (MRE) packaging and shipping containers were characterized in an effort to assuage concerns that combustive disposal of waste at forward operating bases could pose an environmental or inhalation threat. Four types of container materials, both box and liners, including the currently used fiberboard, new corrugated fiberboard with Spectra-kote polymer, new fiberboard without Spectra-kote polymer, and the current fiberboard without wet strength were burned in an open burn test facility that simulated the burn pit disposal methods in Iraq and Afghanistan. MREs, including both current and proposed packaging materials, were added to a single container type to examine their effect on emissions. One quarter of the food was left in the packaging to represent unused meal components. The proposed packaging, consisting of a nano-composite polymer, was added in 25 % increments compared to traditional MRE packaging to create a range of usage levels. Emission factors, mass of pollutant per mass of burned material, were increased over the emission factors of the package containers themselves by the addition of the multi-component MREs, with the exception of Volatile Organic Compounds (VOCs). In general, little distinction was observed when comparing emission factors from the four container materials and when comparing the four MRE compositions. The majority of Particulate Matter (PM) emissions were of particles that were below 1.0 μm in aerodynamic diameter for the fiberboard tests; PM_{2.5} and PM₁₀ emissions increased five-sixfold when MREs were added to fiberboard packaging. Emission factors, particularly VOCs, were negatively correlated to modified combustion efficiency. As combustion quality improved, VOCs and, less notably, polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDDs/PCDFs) declined.

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Appendix A: Data for each sample collected from Open Burning of Fiberboard.

Appendix B: Data for each sample collected from OB of MRE pouches.

List of Acronyms

ANOVA	Analysis of variance
BTU	British thermal unit
CB	Current fiberboard box
CEM	Continuous emission monitor
CH ₄	Methane
CL	Current fiberboard liner
CO	Carbon monoxide
CO ₂	Carbon dioxide
DoD	U.S. Department of Defense
EPA	U. S. Environmental Protection Agency
ESTCP	Environmental Security Technology Certification Program
FID	Flame ionization detector
GC	Gas chromatography
HRGC	High Resolution Gas Chromatography
HRMS	High Resolution Mass Spectrometry
IARC	International Agency for Research on Cancer
IR	Infrared
LOD	Limit of Detection
MCE	Modified combustion efficiency
MLS	Montmorillonite-layered silicates
MRE	Meal, Ready-to-Eat
ND	Not detected
NDIR	Non-dispersive infrared
NSB	No Spectra-kote box
NSL	No Spectra-kote liner
NSRDEC	Natick Soldier Research, Development and Engineering Center
NWS	Current fiberboard box - no wet strength
OBTF	Open Burning Testing Facility
PAHs	Polycyclic aromatic hydrocarbons
PCDDs	Polychlorinated dibenzo- <i>p</i> -dioxin
PCDFs	Polychlorinated dibenzofurans
PCF	photometric calibration factor
PM	Particulate matter
PM ₁	Particulate matter of 1 micrometers or less
PM ₁₀	Particulate matter of 10 micrometers or less
PM _{2.5}	Particulate matter of 2.5 micrometers or less
PM ₄	Particulate matter of 4 micrometers or less
PUF	Polyurethane foam
RPD	Relative percent difference

RSD	Relative standard deviation
SB	Corrugated Spectra-kote polymer fiberboard box
SL	Corrugated Spectra-kote polymer fiberboard liner
STDV	Standard deviation
SVOC	Semivolatile organic compounds
TEF	Toxic equivalency factors
TEQ	Toxic equivalency
VOC	Volatile organic compound
WHO	World Health Organization
XAD-2	Brand name of sorbent polymeric resin (crosslinked polystyrene copolymer)

140 1. Introduction

1.1 Background

Approximately 4000 tons of MRE (Meal, Ready-to-Eat) solid fiberboard packaging waste is generated every year [1]. This amount of waste, coupled with rising disposal costs and hazards encountered with open pit burning in contingency base operations, has dramatically increased the need to investigate

145 alternative materials and designs for combat ration fiberboard packaging applications. This project is a follow-up of a study sponsored by the U.S. Department of Defense (DoD), performed by the Natick Soldier Research, Development and Engineering Center (NSRDEC) to research and develop novel lightweight fiberboard structures to replace the existing military fiberboard containers, with the ultimate goal to reduce the amount of solid waste for the military. This demonstration/validation
150 project, "Lightweight and Compostable Packaging for the Military", is sponsored through a U.S. Army-operated Environmental Security Technology Certification Program (ESTCP), funded by DoD for examining the replacement of solid fiberboard with coated corrugated containers for MRE rations. Each fiberboard box and liner contains 12 MREs. Additional research by NSRDEC is ongoing for the potential replacement of MRE aluminum-based pouches with pouches that are multi-layer, nanocomposite-based
155 polymer materials that can potentially provide greater barrier and mechanical properties [2]. The combined effect of these packaging and MRE material changes has uncertain effects on emissions from combustion disposal.

1.2 Objectives

The objectives of this work were to determine and compare air emissions from open burning of:

- 160 • Current and newly-developed MRE fiberboard packaging options; and
• Current MRE aluminum-based pouches and newly-developed nanocomposite-based pouches.

Emissions that were characterized included health-related compounds: PM_{2.5} and PM₁₀ (particulate matter with aerodynamic diameter equal to and less than 2.5 μm in diameter and particulate matter with aerodynamic diameter equal to and less than 10 μm in diameter), elements/metals in PM,
165 polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs), polycyclic aromatic hydrocarbons (PAHs), carbon monoxide (CO), carbon dioxide (CO₂), and volatile organic compounds (VOCs). PM_{2.5} is a criteria pollutant regulated by the U.S. EPA since these particles can enter the lungs when inhaled and potentially carry metals and other toxic pollutants, which can cause adverse health effects. PCDDs/PCDFs are persistent in the environment and are of interest due to their health
170 effects including immunotoxicity, carcinogenicity, and teratogenicity. Many VOCs are on the U.S. EPA's list of hazardous air pollutants with properties that are toxic and carcinogenic for humans. Some PAHs are classified as possible human carcinogens.

175 2 Materials and Methods

2.1 Test Materials

2.1.1 *Fiberboard*

Seven fiberboard materials were studied for their emissions when combusted in an open burn scenario:

- Current solid fiberboard box (CB);
- Current solid fiberboard liner (CL);
- New corrugated fiberboard box with Spectra-kote polymer (SB) (Spectra-kote Corp., Gettysburg, PA, USA);
- New corrugated fiberboard liner with Spectra-kote polymer (SL);
- New fiberboard box with no Spectra-kote polymer (NSB);
- New fiberboard liner with no Spectra-kote polymer (NSL); and
- Current solid fiberboard box without wet strength (NWS) polymer.

Analyses of these materials (Galbraith Laboratories, Inc., Knoxville, TN, USA) are reported in Table 2-1. Differences in the Spectra-kote boxes/liners are noted, particularly for loss on drying, chlorine, and sulfur.

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Table 2-1. Ultimate proximate analysis for the seven fiberboard materials.

	Current Fiberboard Solid Box	Current Fiberboard Liner	Corrugated Spectra-kote Polymer Fiberboard Box	Corrugated Spectra-kote Polymer Fiberboard Liner	No Spectra-kote Box	No Spectra-kote Liner	Current Fiberboard Box - No Wet Strength
Code	CB	CL	SB	SL	NSB	NSL	NWS
Heat of combustion (BTU*/lb) ¹	8121	7955	7537	7166	7598	7979	8145
Loss on drying (%) ²	7.45	7.49	9.45	9.13	9.48	8.51	10.24
Carbon (%) ³	46.3	46.19	44.99	45.44	45.36	45.85	46.56
Chlorine (ppm) ⁴	188	185	297	251	97	57	139
Hydrogen (%) ⁵	6.08	6.16	6.13	6.02	6.29	6.20	6.03
Nitrogen (%) ⁶	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulfur (%) ⁷	0.234	0.243	0.162	0.155	0.149	0.140	0.236

*British thermal unit(s). Galbraith procedures: ¹S-231; ²S-200; ³ME-14; ⁴ME-4A; ⁵ME-14; ⁶ME-14; ⁷E16-2.

2.1.2 *Meal Ready-to-Eat*

195 MRE packaging consists of a new nanocomposite material and old aluminum-based material. Research conducted by NSRDEC is developing a new potential replacement for the aluminum-based pouches. The new packaging consists of a multi-layer, nanocomposite-based polymer material that can potentially provide greater barrier and mechanical properties [2]. The novel materials disperse modified montmorillonite-layered silicates (MLSs) into thermoplastic in a layered molecular structure that

200 increases the path length of diffusing gases (i.e., oxygen and moisture) and improves the shelf life of the MRE contents.

MRE menu number 14, Spicy penne pasta vegetarian, was used as the base food for the testing and number of packages and sizes to assure a good reproducibility. Four different MRE packaging categories were studied, comprising different percentages of new nanocomposite and old aluminum-based material: 0 % NEW (only old material), 32 % NEW (32 % new material and 68 % old material), 66 % NEW (66 % new material and 34 % old material), and 100 % NEW (only new material) (Table 2-2). The total carbon fraction of each waste material in the four waste categories was calculated using carbon fractions from Liu and Lipták [3], as well as sugar (0.42) and carbohydrates (0.44, as starch) (Table 2-3). For all MRE tests, the current fiberboard packing was used as a substrate (CB/CL, Table 2-1).

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Figure 2-1. A) MRE menu “Spicy penne pasta vegetarian” was used as the base for each waste category burned. Heater not used due to safety concerns (release of H₂ gas). B) New nanocomposite packaging.

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Table 2-2. Weight percentage of material in each waste category.^a

Waste Material	0 % NEW	32 % NEW	66 % NEW %	100 % NEW
Old Al-based material	11	5.7	3.6	NA
New nanocomposite Material	NA	3.6	7.0	11
Plastic	17	18	16	17
Cardboard	29	30	28	29
Paper	1.6	1.6	1.5	1.6
Al-bag	1.7	1.7	6.6	1.7
Matches	1.0	1.0	0.92	1.0
Adsorbent package	0.47	0.48	0.45	0.47
Food waste: Penne pasta	16	17	16	16
Beef stick	2.8	2.8	2.6	2.8
Toaster pastry	4.1	4.2	3.9	4.1
Crackers	2.8	2.8	2.6	2.8
Pretzels	2.6	2.7	2.5	2.7
Cappuccino powder	2.1	2.1	2.0	2.1
Salt	0.65	0.66	0.62	0.65
Seasoning	0.26	0.27	0.25	0.27
Iced tea powder	5.0	5.1	4.8	5.0
Chewing gum	0.82	0.84	0.78	0.83

^a Each waste category comprised of different percentages of new nanocomposite and old aluminum-based material, e.g., 32 % NEW = 32 % new nanocomposite material and 68 % old Al-based material of the total waste.

Table 2-3. Carbon fraction of each waste material and category.^a

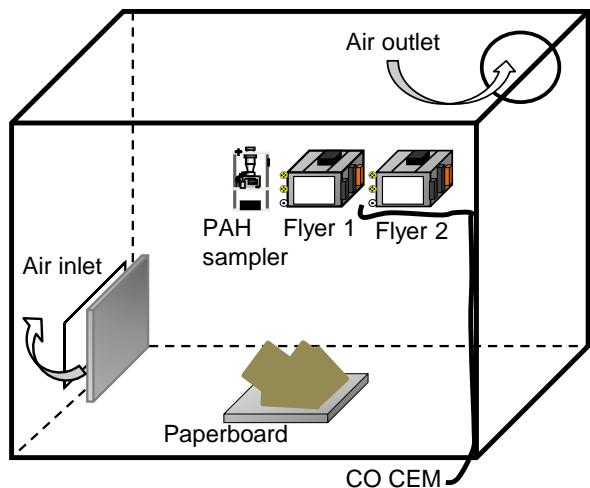
Waste Material	Carbon Fraction in Material	0 % NEW	32 % NEW	66 % NEW	100 % NEW
		Carbon fraction from each waste category ^b			
Old material	0.37	4.2E-02	2.1E-02	1.3E-02	NA
New Material	0.74	NA	2.7E-02	5.2E-02	8.2E-02
Plastic	0.74 ^c	1.3E-01	1.3E-01	1.2E-01	1.3E-01
Cardboard	0.46	1.4E-01	1.4E-01	1.3E-01	1.4E-01
Paper	0.44 ^c	7.0E-03	7.1E-03	6.6E-03	7.0E-03
Al-bag	0.0076 ^c	1.3E-04	1.3E-04	5.0E-04	1.3E-04
Matches	0.50	4.9E-03	5.0E-03	4.7E-03	4.9E-03
Adsorbent package	0.0076 ^c	3.6E-05	3.7E-05	3.4E-05	3.6E-05
Food waste: Penne pasta	0.092	1.5E-02	1.5E-02	1.4E-02	1.5E-02
Beef stick	0.28	7.7E-03	7.8E-03	7.3E-03	7.7E-03
Toaster pastry	0.43	1.8E-02	1.8E-02	1.7E-02	1.8E-02
Crackers	0.51	1.4E-02	1.4E-02	1.3E-02	1.4E-02
Pretzels	0.39	1.0E-02	1.1E-02	9.9E-03	1.0E-02
Cappuccino	0.45	9.4E-03	9.6E-03	8.9E-03	9.4E-03
Salt	0.0076	4.9E-05	5.0E-05	4.7E-05	4.9E-05
Seasoning	0.49	1.3E-03	1.3E-03	1.2E-03	1.3E-03
Iced tea	0.49	2.4E-02	2.5E-02	2.3E-02	2.4E-02
Chewing gum	0.49	4.0E-03	4.1E-03	3.8E-03	4.0E-03
Total	NA	0.42	0.44	0.43	0.46

^a Each waste category comprised of different percentages of new nanocomposite and old aluminum-based material, e.g., 32 % NEW = 32 % new nanocomposite material and 68 % old Al-based material of the total waste. ^b Data from Liu and Lipták [3]. ^c Carbon fraction in material × waste fraction in recipe.

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2.2 Open Burn Test Facility

This work was conducted in the U.S. EPA's Open Burning Testing Facility (OBTF) located at EPA's Research Triangle Park, NC, campus (Figure 2-2). The open burn test facility consists of a 12.8 × 12.8 × 15 feet (3.9 × 3.9 × 4.6 m) structure constructed with sheetrock wallboard that is covered with stainless steel for ease of cleaning. High volume air handlers provide dilution air into the test facility to help ensure that open burn conditions (minimal depletion of oxygen concentration) are maintained within the facility during the tests. Measurements of the emissions exiting from the enclosed facility, together with the dilution rate of incoming combustion air, allow for calculation of emission factors in terms of pollutant mass per mass of material burned. The facility flowrate results in approximately one air volume change every 90 sec. The dilution air and combustion emissions exit the test facility through an 8-inch diameter (20.3 cm) transfer duct.



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Figure 2-2. Schematic of open burn test facility. Not to scale.

2.3 Test Procedure

The fiberboard/MRE sample was placed randomly on aluminum foil atop a sand-filled 3.2 × 3.2 foot (1 m × 1 m) steel plate (Figure 2-3, Figure 2-4). The average fiberboard weight for each burn was 4.7 lb (2.1 kg), 5.6 lb (2.6 kg), 5.5 lb (2.5 kg) and 5.7 lb (2.6 kg) for CB/CL, SB/SL, NSB/NSL and NWS, respectively. Six MRE bags and half of a CB/CL fiberboard box was used for each MRE burn (based on 12 MRE bags in one fiberboard box); only 25 % of the food was included, simulating food not eaten.

245

Each burn was started with the use of a propane torch. Semivolatile organic compounds (SVOCs) and particulate matter (PM) collection started at ignition while Volatile Organic Compound (VOC) (SUMMA canister) sampling was started with a trigger when the CO₂ concentration had reached 800 ppm (this delay avoided the SUMMA canister opening prematurely during the ignition while the operator was still within the OBTF). VOC sampling was stopped when the CO₂ concentration diminished to 800 ppm. The SVOC and PM collection were stopped when the CO₂ concentration had reached the background concentration of approximately 400-500 ppm CO₂.

255



Figure 2-3. The paperboard test material (corrugated Spectra-kote Polymer Fiberboard box and liner) atop aluminum foil (left) on 1 m x 1 m (3.2 ft × 3.2 ft) steel pan. Combustion of same (right).



260 Figure 2-4. MRE (100 % OLD material or 0 % NEW) on 3.2 × 3.2 foot steel pan, before (left) and
265 after (right) burn.

2.3.1 Test Matrix

265 The fiberboard tests and the MRE tests were conducted at separate times, November 2014 and July
2015, respectively. The tests were performed in random order (Table 2-4 and Table 2-5). To receive
detectable levels of PCDD/PCDF, two to six separate burns had to be composited into one sample (one
test). Table 2-6 shows the number of collected samples for each fiberboard and MRE category. A
background sample was collected for each of the two test periods.

270 Table 2-4. Fiberboard test matrix.^a

Fiberboard Type	Code	Test order	No. of Tests	Ash Samples
NA- OBTF Blank	BS	Pre-Test	1	NA
Current Fiberboard Container and Current Fiberboard Liner	CB/CL	3, 5, 7, 8	4	1 (composite)
New Polymer Coated Fiberboard Container and New Polymer Coated Fiberboard Liner	SB/SL	6, 9, 10, 11	4	1 (composite)
New Non-Polymer Fiberboard Container and New Non-Polymer Fiberboard Liner	NSB/NSL	4, 14, 15, 16	4	1 (composite)
Current Fiberboard, No Wet Strength	NWS	1, 2, 12, 13	4	1
NA - OBTF Blank	BS	Post-Test	1	NA

^a NA – not applicable.

Table 2-5. MRE test matrix.^a

Test Material	Code	Test order	No. of Tests
MRE Menu No. 11, 100 % New Material	100 % NEW	1, 4, 9	3
MRE Menu No. 11, 66 % New Material	66 % NEW	11, 12, 13	3
MRE Menu No. 11, 32 % New Material	32 % NEW	7, 8, 10	3
MRE Menu No. 11, 0 % New Material (100 % Old material)	0 % NEW (100 % OLD)	2, 3, 5	3
Baseline: Current Fiberboard Container and Current Fiberboard Liner	CB/CL	6	1
NA - OBTF Blank	BS	Post-Test	1

^a NA – not applicable.

275

Table 2-6. Collected samples for each test category.

Test Category	VOCs SUMMA Canisters	PM _{2.5}	PM ₁₀	PAH	PCDD/PCDF
CB/CL	5	10	10	5	5
SB/SL	4	7	7	4	4
NSB/NSL	4	8	8	4	4
NWS	4	10	10	3	4
100 % NEW	3	6	6	3	3
66 % NEW	2	6	6	3	3
32 % NEW	3	6	6	3	3
0 % NEW (100 % OLD)	3	6	6	3	3
Background	2	2	2	2	3
Total	30	61	61	30	32

2.3.2 Emission Sampling System

Emission sampling was conducted using the “Flyer”, which is a remotely controlled sampling system (Figure 2-5) described more fully elsewhere [4; 5]. The Flyer includes an on-board computer, control software, and wireless transmitters which allow sampling to be monitored and controlled from a distance. Sampling periods are controlled using “triggers” and software to operate multiple on/off valves. Interchangeable sampling instruments allow for continuous CO₂, CO, temperature, and PM measurements as well as batch sampling of VOCs, SVOCs, PM₁₀ and PM_{2.5}. The on-board computer and wireless data transfer also allow the operator to monitor CO₂ concentration, battery life, and pressure drop across a filter in real time. All sensor data and flow rates are logged to the on-board computer. A smaller version of the flyer was used to sample PAHs. To quantify the designated target analytes, the Flyer was comprised of the instruments indicated in Figure 2-6 shows monitoring of the Flyer samplers.



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Figure 2-5. Flyer sampling instruments.

Table 2-7. Flyer emission sampling.

Pollutant	Instrument/Method(s)	Duration	Analytical Laboratory
PM _{2.5} and PM ₁₀	SKC impactors, 47 mm Teflon filters, PM by mass	Batch	Chester LabNet
PCDD/PCDF, PAH	Modified U.S. EPA Method TO-9A [6], U.S. EPA Method 23 [7]/HRGC-HRMS, U.S. EPA Method 8270D [8]/HRGC-LRMS	Batch	EPA/ORD
VOCs	SUMMA Canister/U.S. EPA Method TO-15 [9], including CO ₂ , CO, CH ₄ /U.S. EPA Method 25C [10]	Integrated run, 12 min samples	ALS Simi Valley
Metals	Teflon filters/gravimetric and X-ray fluorescence (XRF) [11]	Batch	Chester LabNet
PM mass and size	DustTrak DRX (PM ₁ , PM _{2.5} , PM ₄ , PM ₁₀ and Total PM)	Continuous	EPA/ORD
CO ₂	LI-COR 820, Non-dispersive Infrared (NDIR)	Continuous	EPA/ORD
CO	Electrochemical cell, e2V EC4-500-CO	Continuous	EPA/ORD



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Figure 2-6. Monitoring of CEMs, SVOC flow rate, temperature, and SUMMA canister pressure during a burn.

2.4 Emission Sampling and Analytical Methods

2.4.1 SVOCs

300 PCDDs/PCDFs and PAHs were sampled using a low voltage Windjammer and MINIjammer brushless direct current blower (AMETEK Inc., Berwyn, PA, USA), respectively. The blowers were started via wireless control at the start of the burn. The flow rate was measured by a 0-622 Pa pressure differential transducer (Setra, Model 265, Boxborough, MA, USA) across Herschel Standard Venturi tubes. The Venturi tubes were designed at EPA to meet the desired sampling rate for the target compound. The
305 Venturi tubes were mounted on the outlet of the Windjammer and MINIjammer blowers. The voltage equivalent to this pressure differential was recorded on the onboard PC using the FlyerDAQ program or ARDUINO-based computer, which was calibrated with a Roots meter (Model 5M, Dresser Measurement, Addison, TX, USA) in the U.S. EPA Metrology Laboratory before sampling effort. A temperature thermistor was used to measure the air temperature exiting the Venturi.

310 PCDD/PCDFPCDDs/PCDFs were sampled via modified U.S. EPA Method TO-9A [6] using a polyurethane foam (PUF) sorbent preceded by a quartz microfibermicrofiber filter (20.3 × 25.4 cm) with a nominal sampling rate of 0.85 m³/min (Windjammer). PAHs were also sampled via modified U.S. EPA Method TO-9A [6] using a PUF/XAD-2 (polymer resin, Supelco Inc., Bellefonte, PA, USA)/PUF sorbent behind a quartz microfibermicrofiber filter (70 mm in diameter) with a nominal sampling rate of 0.18 m³/min
315 (MINIjammer). The PUF (Tisch Scientific, North Bend, OH, USA) was cleaned before use by solvent extraction with dichloromethane and dried with flowing helium to minimize contamination of the media with the target analytes and remove unreacted monomer from the sorbent. The PUF and PUF/XAD/PUF sorbents were mounted in a glass cartridges (Tisch Scientific) and inserted in a cartridge holder mounted on the Windjammer and MINIjammer blowers. The samples was extracted and cleaned up according to
320 U.S. EPA Method 23 [7] and analyzed using high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). Blanks were collected and analyzed.

2.4.1.1 PCDD/PCDF

Analysis of tetra- through octa-CDDs/CDFs was performed according to modified U.S. EPA Method 23 [7]. Identification and quantification of the PCDD/PCDF congeners made use of a mixture of standards
325 (Cambridge Isotope Laboratories, Tewksbury, MA, USA) containing tetra- to octa-CDD/CDF native and 13C-labeled congeners as per modified U.S. EPA Method 23 [7]. The PCDD/PCDF calibration solutions were prepared in house and contained native PCDD/PCDF congeners at concentration from 0.25 to 40 ng/mL.

The 2005 World Health Organization (WHO) 2005 toxic equivalency factors (TEFs) [12] were used to
330 determine the PCDD/PCDF toxic equivalency (TEQ) emission factors (see Chapter 2.5 for calculations). Not all TEF-weighted PCDD/PCDF congeners were detected in all samples. The congeners that were not detected (ND) were set to zero in the text although Appendix A and B show the PCDD/PCDF values both at ND = 0 and ND = limit of detection (LOD)). All surrogate standard recoveries were between 63 % and 110 % for the fiberboard burn samples, which was within the standard method criteria (25-130 %). Some
335 of the surrogate standard recoveries were outside the standard method criteria (25-130 %) for the MRE

burn samples due to interference from significant amounts of other compounds in the ^{13}C channels causing a low response for the compound pre-analysis.

2.4.1.2 PAHs

Internal standards (Cambridge Isotope Laboratories, Tewksbury, MA, USA) were added to the sorbent
340 before the sample was collected. The surrogate recoveries were measured relative to the internal standards and are a measure of the PUF/XAD/PUF/filter collection efficiency. A deuterated recovery standard, D10-pyrene, was added before mass analysis. Samples were analyzed on a Thermo Trace1310/ISQ GC/MS (Thermo Electron North America LLC, West Palm Beach, FL, USA) utilizing full-scan mode. All surrogate standard recoveries were between 48 and 110 percent, which was within the
345 standard method criteria (25 and 130 %).

2.4.2 VOCs

Volatile organic compounds were sampled via U.S. EPA Method TO-15 [9]. Sampling for VOCs was accomplished using laboratory-supplied 6-L SUMMA canisters (ALS, Simi Valley, CA, USA). Each SUMMA canister was equipped with a manual valve, metal filter (frit), pressure gauge, pressure transducer, and
350 an electronic solenoid valve. Pre-sampling tests showed canister fill times of 12 min.

The SUMMA valves were checked for leakage before sample collection by ensuring that the pressure gauge was not showing decreased vacuum with time. The SUMMA had its electronic solenoid valve controlled by the Flyer data acquisition (FlyerDAQ) program. The pressure transducer and electronic solenoid valve were connected to the Flyer, and the manual valve was opened. The electronic solenoid
355 valve sampling system was opened and closed based on CO₂ concentration set points using the FlyerDAQ program. When the LI-820 measures elevated levels of CO₂, the Flyer DAQ enables the solid state relay, opening the SUMMA's solenoid valve to start sampling at the chosen frit filter sampling rate. The pressure transducer provided information on the status of the SUMMA (i.e., empty, filling, or full) to the FlyerDAQ interface. Following the end of sampling, the manual valve was closed, the SUMMA
360 dismounted from the Flyer, the solenoid valve removed, and the canister was returned to its shipping container. SUMMA canisters were shipped to and from the field in boxes as per (ALS Environmental) instructions.

The VOCs were analyzed by ALS Laboratories (Simi Valley, CA) using U.S. EPA Method TO-15 [9] using full scan mode gas chromatography-low resolution mass spectrometry (GC/LRMS). The SUMMA canisters
365 were also analyzed for CO₂, CO, and CH₄ by a GC/ flame ionization detector (FID) according to modified U.S. EPA Method 25C [10] by ALS Laboratories (Simi Valley, CA).

2.4.3 PM

2.4.3.1 PM batch sampling

PM_{2.5} and PM₁₀ were sampled with SKC impactors using 47 mm tared Teflon filters with a pore size of 2.0
370 μm via a Leland Legacy sample pump (SKC Inc., Pittsburgh, PA, USA) with a constant airflow of 10 L/min. PM was measured gravimetrically following the procedures described in 40 CFR Part 50 [13]. Particles larger than 10 μm in the PM₁₀ impactor (or larger than 2.5 μm in the PM_{2.5} impactor) were collected on

an oiled 37 mm impaction disc. The Leland Legacy Sample pump was calibrated with a Gilibrator Air Flow Calibration System (Sensidyne LP, St. Petersburg, PA, USA).

375 2.4.3.2 PM continuous sampling

The TSI DustTrak DRX Model 8533 (TSI, Inc., Knoxville, TN, USA) was used to measure time-resolved particle size distributions. The DustTrak DRX measures light scattering by aerosols as they intercept a laser diode and has the capability of simultaneous real time measurement (every second) of PM₁, PM_{2.5}, Respirable (PM₄), PM₁₀ and Total PM (up to 15 µm). The aerosol concentration range for the DustTrak DRX was 0.001-150 mg/m³ with a resolution of ±0.1% of the reading. The flow accuracy is ±5 % of internal flow as controlled. The DustTrak DRX was factory-calibrated yearly to the respirable fraction (PM₄), with a photometric calibration factor (PCF) value of 1.00. A custom PCF was conducted as per manufacturer's recommendations for PM_{2.5} and PM₁₀ using the simultaneously sampled PM_{2.5} and PM₁₀ by filter impactor concentrations (averaged continuous PM_{2.5} (or PM₁₀) concentration divided by PM_{2.5} or PM₁₀ by filter mass concentration). This factor was applied to scale the real time data. A zero calibration was performed before each day using a zero filter which comes with the DustTrak DRX. Similarly, a daily flow calibration was performed with a Gilibrator flowmeter following procedures in Operation and Service Manual Model 8533/8534 (P/N 6001898, Revision F, January 2011). The DustTrak inlet was cleaned after each day with a cotton swab.

390 2.4.4 CO₂

CO₂ was continuously measured using an NDIR instrument (LI-COR 820 model, LI-COR Biosciences, Lincoln, NE, USA). This unit was configured with a 14 cm optical bench, giving it an analytical range of 0-20,000 ppm with an accuracy specification of less than 3 % of reading. The LICOR was calibrated in accordance with U.S. EPA Method 3A [14] with three-point zero and calibration drift test. The LI-COR 820 CO₂ concentration was recorded every second on the onboard computer using the FlyerDAQ program. The calibration error for all test days was between 0.001 % and 0.559 %, and the system drift was between 0.015 % and 0.319 %, below the error and drift acceptance criteria of 5% and 3%, respectively, as stated by the U.S. EPA Method 3A [14].

2.4.5 CO

400 A Horiba Model VIA510 CO monitor (Horiba Instruments, Inc, Chicago III) was used on the side of the Flyer's CO₂ inlet during the paperboard tests (November 2014 test period). The analyzer operates by directing identical infrared (IR) beams through an optical sample cell and a sealed optical reference cell. A detector, located at the opposite end of the cells, continuously measures the difference in the amount of infrared energy absorbed within each cell. This difference is a measure of the concentration of the component of interest in the sample. The CO analyzer adheres to U.S. EPA Method 10 [15]. Calibration and post drift tests were performed each test day. The calibration error for all test days was between 0.01 % and 1.10 %, and the system drift was between 0.66 % and 1.57 %, below the error and drift acceptance criteria of 5% and 3%, respectively, as stated by the U.S. EPA Method 3A [14].

An electrochemical gas sensor (e2V EC4-500-CO, SGX SensorsTech, Buckinghamshire, United Kingdom) was used for the MRE tests. This sensor measures CO concentration by means of an electrochemical cell through CO oxidation and changing impedance. The E2v CO sensor has a CO detection range of 1-500 ppm with resolution of 1 ppm and sensitivity of 55-85 nA/ppm. The response time is less than 30 seconds. The CO sensor was calibrated and tested for post-drift on a daily basis in accordance with U.S. EPA Method 3A. The system drift was between 0.168 % and 4.993 % (for one test day only, otherwise below 3 %), which was both above and below the 3 % acceptance criterion as stated by the U.S. EPA Method 3A [14], respectively. For the test day where the drift was 4.993 %, the calibration curve was used for the first half of the tests and the post-drift curve was used for the second half of the tests.

420 2.5 Calculations

2.5.1 *Emission factors*

The emission factor for each species was calculated from the ratio of pollutant concentrations to background-corrected carbon concentration as calculated from CO₂ and CO measurements (ΔCO_2 , ΔCO and ΔCH_4 for VOCs). Emission factors were calculated using these concentrations and the fraction of C in fiberboard/MRE material, following the carbon balance method [16]. This approach assumes that all carbon in the combusted material is emitted as CO₂, CO, and CH₄.

$$\text{Emission Factor (g Pollutant/g Material)} = Fc \times \frac{\text{Pollutant } \left(\frac{\text{mg}}{\text{m}^3}\right)}{\sum \text{Carbon } \left(\frac{\text{mg}}{\text{m}^3}\right)} \quad \text{Equation 2-1}$$

where: Fc = carbon fraction in the fiberboard/MRE material, Carbon = amount of carbon sampled derived from ΔCO_2 , and ΔCO (and ΔCH_4 for VOCs) concentration in the plume.

2.5.2 *PCDD/PCDF Toxic Equivalent Calculations*

PCDDs and PCDFs include 75 and 135 congeners, respectively. Of these 210 congeners, 17 are toxic and have been assigned TEF values [12] (Table 2-8). The TEQ value is obtained by multiplying the concentration of a PCDD/PCDF congener by its TEF-value and summarizing the result for all 17 toxic congeners. The U.S. EPA has listed 16 priority PAHs. Some of these PAHs are probably carcinogenic to humans according to U.S. EPA.

Table 2-9 lists these 16 PAHs and their TEFs for humans.

440 Table 2-8. PCDD/PCDF Toxic Equivalency Factors for mammals/humans [12].

PCDDs	TEF	PCDFs	TEF
2,3,7,8 - TCDD	1	2,3,7,8 - TCDF	0.1
1,2,3,7,8 - PeCDD	1	1,2,3,7,8 - PeCDF	0.03
1,2,3,4,7,8 - HxCDD	0.1	2,3,4,7,8 - PeCDF	0.3
1,2,3,6,7,8 - HxCDD	0.1	1,2,3,4,7,8 - HxCDF	0.1
1,2,3,7,8,9 - HxCDD	0.1	1,2,3,6,7,8 - HxCDF	0.1
1,2,3,4,6,7,8 - HpCDD	0.01	1,2,3,7,8,9 - HxCDF	0.1
1,2,3,4,6,7,8,9 - OCDD	0.0003	2,3,4,6,7,8 - HxCDF	0.1
		1,2,3,4,6,7,8 - HpCDF	0.01
		1,2,3,4,7,8,9 - HpCDF	0.01
		1,2,3,4,6,7,8,9 - OCDF	0.0003

Table 2-9. PAH Toxic Equivalency Factors for humans [17].

Compound	TEF	Compound	TEF
Naphthalene	0	Benzo(a)anthracene ^{a,b}	0.005
Acenaphthylene	0	Chrysene ^{a,d}	0.03
Acenaphthene	0	Benzo(b)fluoranthene ^a	0.1
Fluorene ^{c,d}	0	Benzo(k)fluoranthene ^{a,b}	0.05
Phenanthrene ^{c,d}	0.0005	Benzo(a)pyrene ^{a,b}	1.0
Anthracene ^{c,d}	0.0005	Indeno(1,2,3-cd)pyrene ^{a,b}	0.1
Fluoranthene ^{c,d}	0.05	Dibenz(a,h)anthracene ^a	1.1
Pyrene ^{c,d}	0.001	Benzo(ghi)perylene ^{c,d}	0.02

^a Probably carcinogenic to humans according to US EPA. ^b Probably and possibly carcinogenic to humans according to International Agency for Research on Cancer (IARC). ^c Not classifiable as carcinogenic to humans according to US EPA.

445 ^d Not classifiable as carcinogenic to humans according to IARC.

2.5.3 Modified Combustion Efficiency

The modified combustion efficiency (MCE) (Equation 2-2) is a measure of combustion behavior or how well the fuel is being burned where MCE = 1.0 is complete combustion. The MCE can be categorized as MCE ≥ 0.95, indicating flaming conditions (good combustion) and MCE < 0.90, indicating smoldering conditions (poor combustion).

$$MCE = \frac{\Delta CO_2}{\Delta CO_2 + \Delta CO} \quad \text{Equation 2-2}$$

2.6 Data Precision

The data precision was checked by calculating:

- Relative percent difference (RPD) for any pair of duplicates

460

$$RPD = 100 \times \frac{Q - B}{Q + B} \quad \text{Equation 2-3}$$

where: Q = results from one sample, B = results from replicate samples

465

- Standard deviation (STDV) if more than duplicate measurements were conducted

$$STDV = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2} \quad \text{Equation 2-4}$$

470

Where where: μ = average results from all samples, x_i = results from one sample

N = number of samples

Or expressed as Relative Standard Deviation (RSD)

$$RSD = 100 \times \frac{STDV}{Average} \quad \text{Equation 2-5}$$

475 Single factor one-way analysis of variance (ANOVA) with alpha of 0.05 (level of significance) was used to determine any differences between the four fiberboards types and between the four MRE waste compositions types. To establish significant difference the ANOVA returned p value (significant value) has to be less than the alpha value (0.05) and the F-distribution value (F/F_{crit}) has to be greater than 1.0.

480 3 Results and Discussion

Results from each collected sample are presented in Appendix A and B.

3.1 PM

3.1.1 Fiberboard packaging

Typical traces of PM, CO, and CO₂ throughout each of the fiberboard burns are shown in Figure 3-1 A-D,

485 below. In general, concentrations of CO and CO₂ mimic the increase in particle concentration. Peak particle concentrations range from 10-20 mg/m³, although one packaging type, NWS, exceeded 50 mg/m³. The similarity of the PM₁ to Total PM traces (Figure 3-1) indicates that the majority of the particles are small, < 1 μ m, and therefore respirable. Figure 3-2 examines PM emission factors with time over the replicates and also plots MCE to see if there is any relationship between PM emissions and
490 combustion quality. While most of the runs have consistent, packaging-specific emission factors, the variance in a few runs illustrates the effect of random waste orientation on emissions. Also, while there are suggestions from limited tests that poor combustion quality (low MCE) increases PM emissions (NSB/NSL R² of 0.81 and SB/SL R² of 0.55, figure not shown), the correlations seem inconsistent (CB/CL R² of 0.056 and NWS R² of 0.056, figure not shown). Single factor ANOVA showed no statistical
495 difference between the PM emission factors for the different fiberboard types ($F = 0.24$, $p = 0.56$).

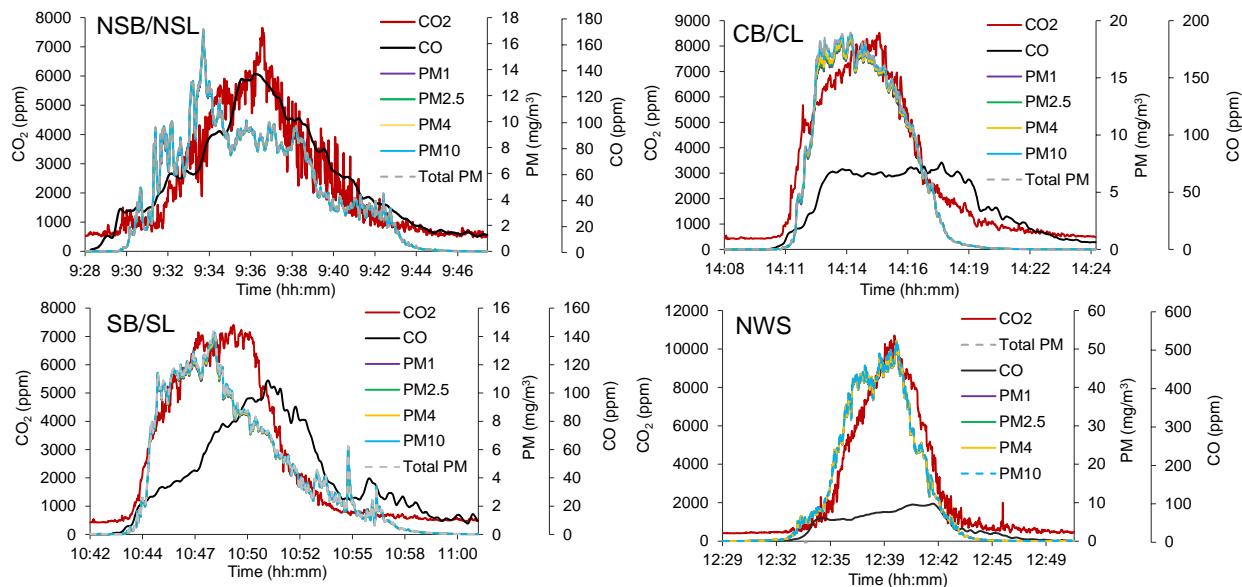
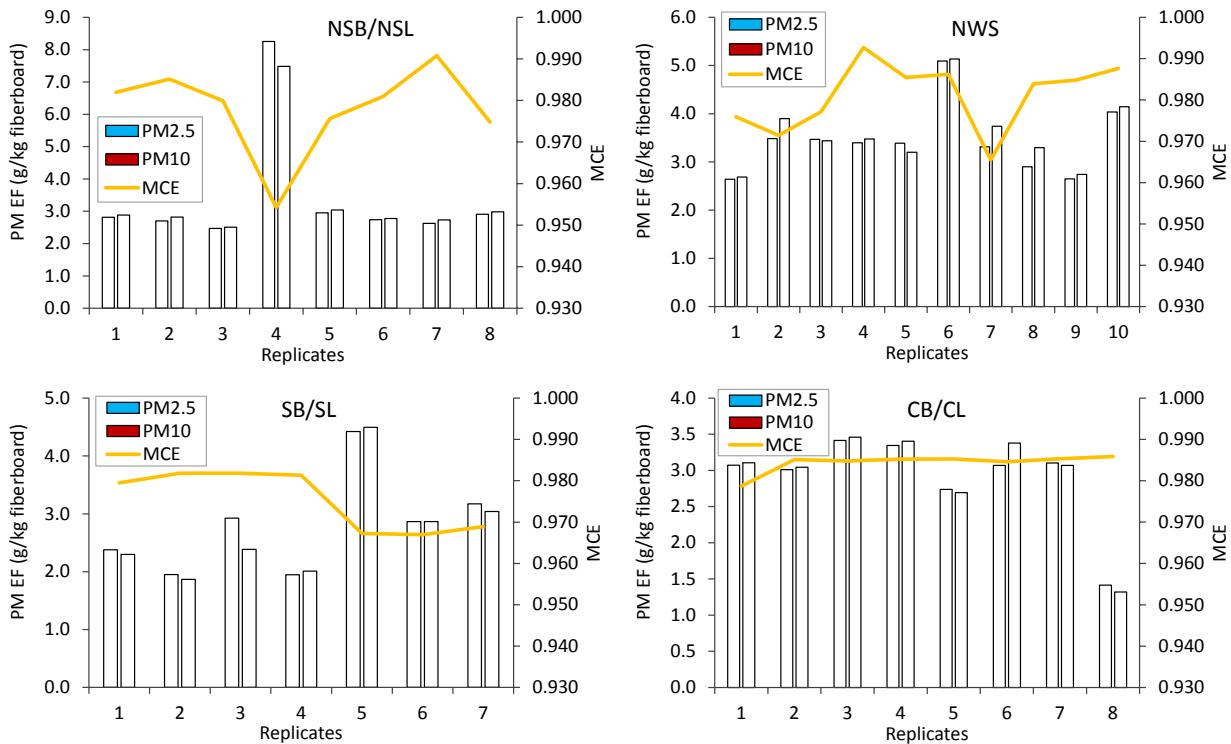
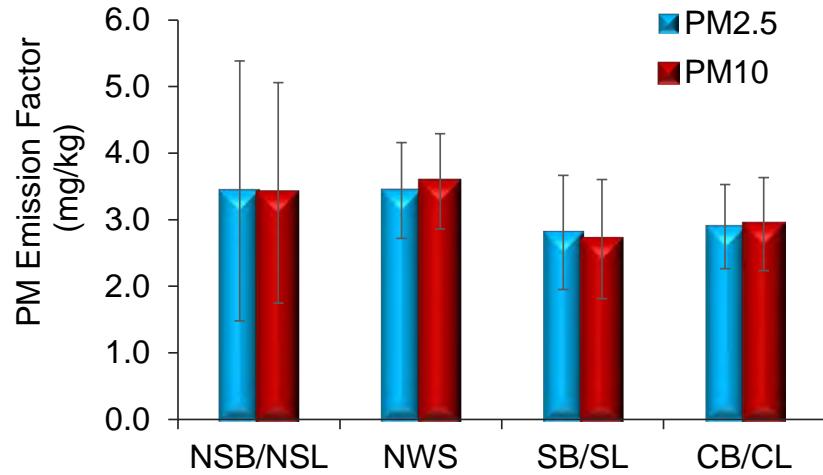


Figure 3-1. Typical traces of PM, CO, and CO₂ throughout each of the fiberboard type burns.



500 Figure 3-2. PM_{2.5} and PM₁₀ emission factors and modified combustion efficiency (MCE) for each replicate.



505 Figure 3-3. PM_{2.5} and PM₁₀ emission factors from open burning of fiberboard. Error bars represent 1 STDEV.

510 Table 3-1. PM emission factors.

Paperboard	PM_{2.5} mg/kg Paperboard		PM₁₀ mg/kg Paperboard	
	Average	STDV	Average	STDV
NSB/NSL	3.4	1.95	3.4	1.66
NWS	3.4	0.72	3.6	0.72
SB/SL	2.8	0.86	2.7	0.89
CB/CL	2.9	0.63	2.9	0.70

3.1.2 MRE pouches

PM emission factors are shown in

Figure 3-4 for the MRE waste compositions and the baseline CB/CL. As with fiberboard packaging, addition of any MRE composition to the baseline CB/CL fiberboard increases the emission factor by approximately 3-4 times. The effect of composition changes on PM emission factors, however, is indiscernible (single factor ANOVA F = 0.24, p = 0.53). The PM₁₀ is nearly the same as PM_{2.5}, indicating that the vast majority of the PM is 2.5 micrometers in size or less. The PM emission factors did not correlate with the MCE (Figure 3-5), $r^2 = 0.0011-0.34$ (scatter plot not shown).

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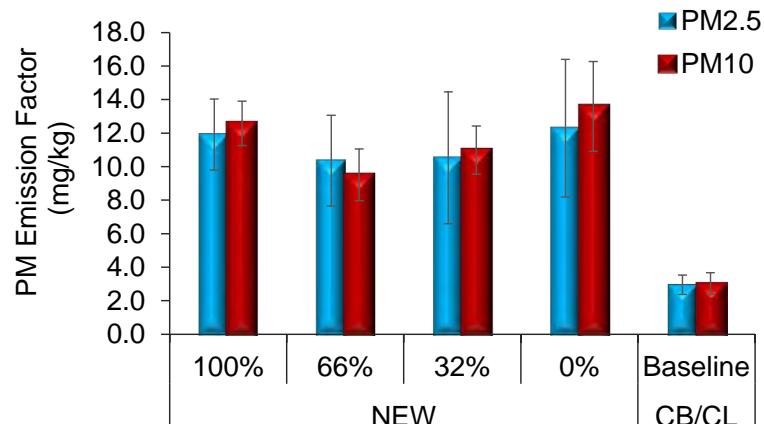
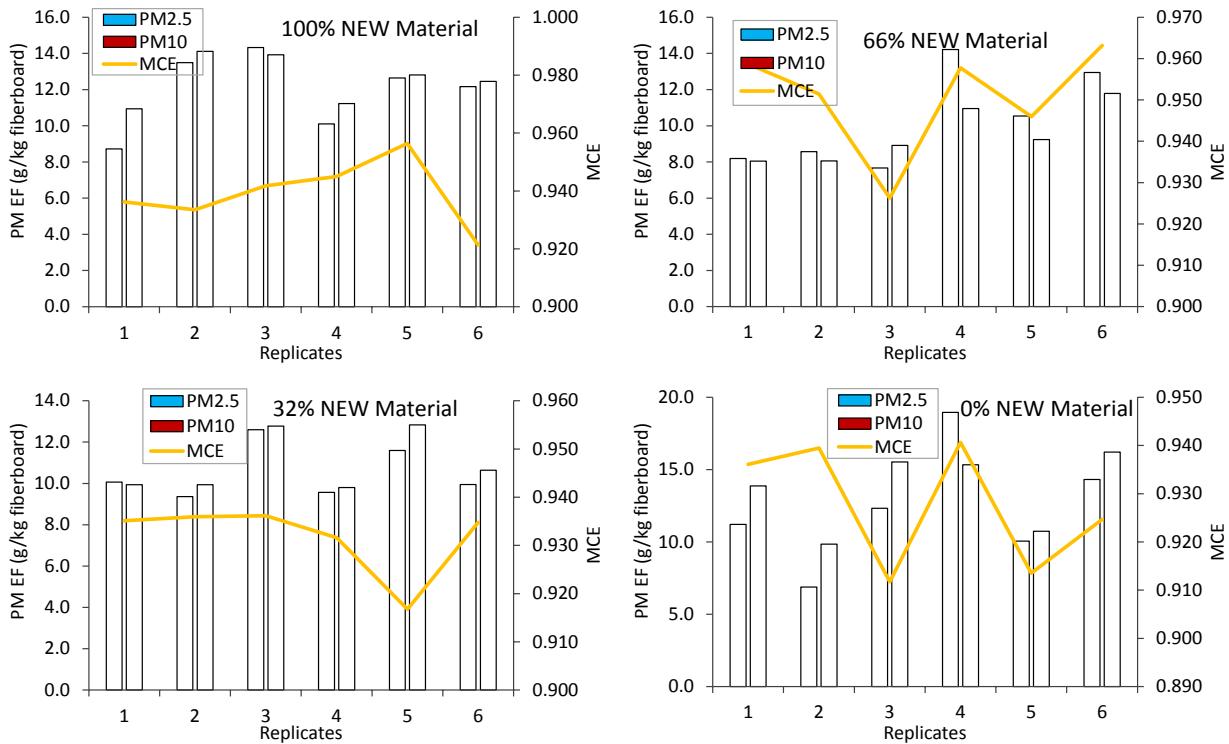


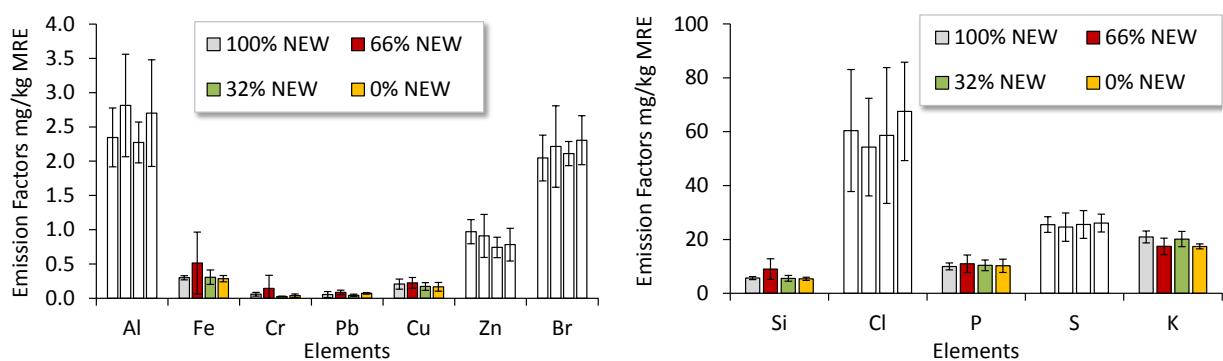
Figure 3-4. PM emission factors from open burning of MREs. Error bars represent 1 STDV.



525 Figure 3-5. PM_{2.5} and PM₁₀ emission factors and modified combustion efficiency (MCE) for each replicate.

3.2 Metals and Other Trace Elements

530 Emission factors for metals and other trace elements are shown in Figure 3-6 and Table 3-2 for the MRE waste composition. No effect on the emission factors was found for the different MRE waste compositions. Chlorine (Cl), Sulfur (S), Potassium (K) were the most abundant elements observed. The Al emission factors were very similar for the four MRE waste compositions, 2.3-2.8 mg/kg MRE.



535 Figure 3-6. Major metal and trace /element emission factors from open burning of MRE's.

Table 3-2. Major metal and trace /element emissions from open burning of MRE pouches.^a

Element	100 %		66 %		NEW		0 %	
	mg/kg	STDV	mg/kg	STDV	mg/kg	STDV	mg/kg	STDV
Al	2.3	0.43	2.8	0.75	2.3	0.30	2.7	0.78
Fe	0.30	0.030	0.51	0.45	0.31	0.11	0.29	0.046
Cr	0.059	0.027	0.15	0.19	0.027	0.0058 ^b	0.040	0.025
Pb	0.056	0.044	0.086	0.033	0.045	0.016	0.071	0.012
Cu	0.21	0.075	0.23	0.079	0.17	0.057	0.17	0.062
Zn	0.97	0.18	0.91	0.31	0.74	0.15	0.78	0.24
Br	2.0	0.33	2.2	0.59	2.1	0.18	2.3	0.36
Si	5.7	0.56	9.0	3.8	5.6	1.1	5.4	0.6
Cl	60	23	54	18	59	25	68	18
P	10	1.3	11	3.2	10	2.0	10	2.5
S	26	2.9	25	5.3	26	5.2	26	3.3
K	21	2.2	17	3.1	20	2.8	17	0.91

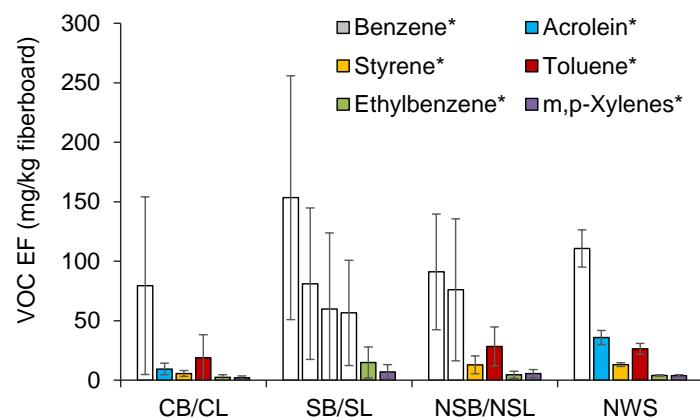
^a The metals and trace elements here were selected based on the number of samples where the material was detected more than three times the uncertainty level of the analysis. Full list of all XRF elements analytes are shown in Appendix B, Table B19. ^b Relative difference.

540

3.3 VOCs

3.3.1 Fiberboard packaging

Results for select VOC emission factors for the MRE fiberboard packaging burns are shown in Figure 3-7 and Table 3-3 . For the four packaging types, benzene is the most prevalent VOC at approximately 80 to 545 150 mg/kg of fiberboard material. For three of the four materials, acrolein is the next most prevalent. Typical combustion-related aromatic pollutants (benzene, toluene, acrolein, and xylenes) are linearly related to the MCE value (Figure 3-8). A more complete set of emission factors by packaging type is shown in Appendix A, Tables A26-29.



550 Figure 3-7. Select VOCs and their emission factors for the different fiberboard types. * = on EPA's list of hazardous air pollutants.

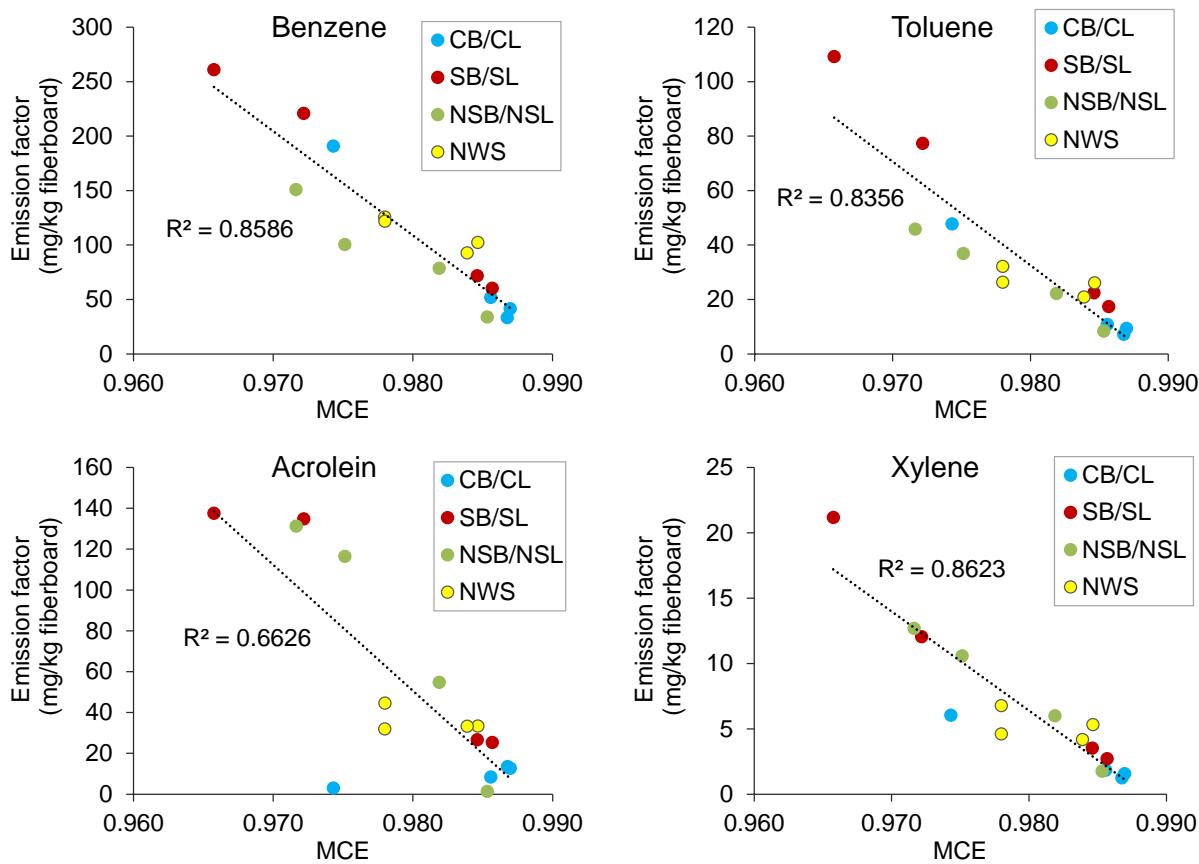


Figure 3-8. Select VOCs versus modified combustion efficiency (MCE).

Table 3-3. VOC emission factors.

Compound	CB/CL		SB/SL		NSB/NSL		NWS	
	Average mg/kg	STDV mg/kg	Average mg/kg	STDV mg/kg	Average mg/kg	STDV mg/kg	Average mg/kg	STDV mg/kg
Benzene ^a	79	75	153	102	91	49	111	16
Propene	38	42	118	94	84	57	51	9.4
Vinyl Acetate ^a	33	13	98	70	50	NA	48	9.7 ^b
Acrolein ^a	9.4	4.8	81	64	76	60	36	5.9
Toluene ^a	19	19	57	44	28	16	26	4.6
1,3-Butadiene ^a	19	22	44	43	34	23	24	5.3
Styrene ^a	5.6	2.5	60	64	13	7.5	13	1.6
2-Butanone (MEK)	9.3	11	23	19	24	16	10	3.0
Ethylbenzene ^a	2.4	2.2	15	13	4.6	2.9	4.1	0.60
Methylene Chloride	5.5	5.3	2.2	2.1 ^b	3.1	3.4	6.7	5.3
<i>m</i> , <i>p</i> -Xylenes ^a	1.9	1.7	6.9	6.1	5.5	3.5	3.7	0.82
<i>o</i> -Xylene ^a	0.74	0.58	2.9	2.6	2.2	1.4	1.5	0.32
Acetonitrile	1.2	1.1	3.0	2.0	1.6	0.84	0.62	0.10
Cumene ^a	0.33	NA	1.5	1.4	0.29	0.12	0.20	0.027

^a Included in the EPA list of hazardous air pollutants. ^b Relative difference. NA = not applicable. The VOCs shown here were selected based on the number of samples where the compound was detectable above three times the detection limit with relevance to the EPA's list of hazardous air pollutants. Full list of the 88 VOCs analyzed and their emission factors are presented in Appendix A, Tables A26-29.

3.3.2 MRE pouches

Select VOC data for the MRE packaging are shown in Figure 3-9, and values for the full data set are in Table 3-4. As with the fiberboard packaging, benzene is the most common compound followed by acrolein. All VOC concentrations are higher with the presence of MREs than the CB Baseline. No concentration trend with changing amounts of NEW material is noted. As for the fiberboard, the selected VOCs showed a linear relationship with MCE (increased emission factors with decreased MCE), Figure 3-10. Although the R^2 of 0.39-0.78 was lower for open burning of MRE than for only combusting fiberboard (R^2 of 0.66-0.86), these differences can be due to the overall better MCE occurring during the fiberboard burns, Figure 3-11.

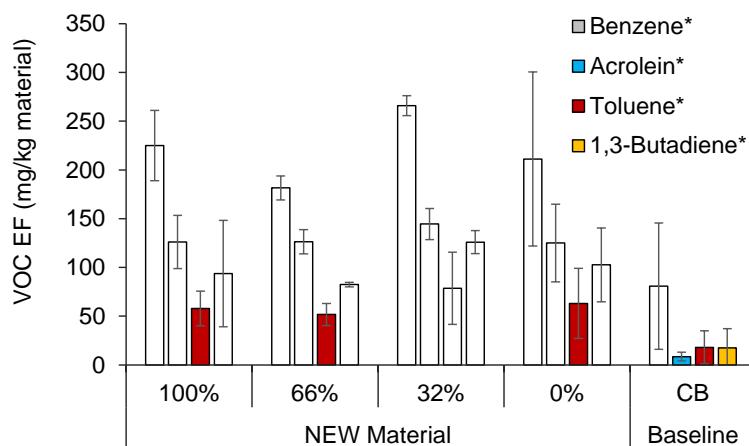


Figure 3-9. VOC emission factors from open burning of MREs.

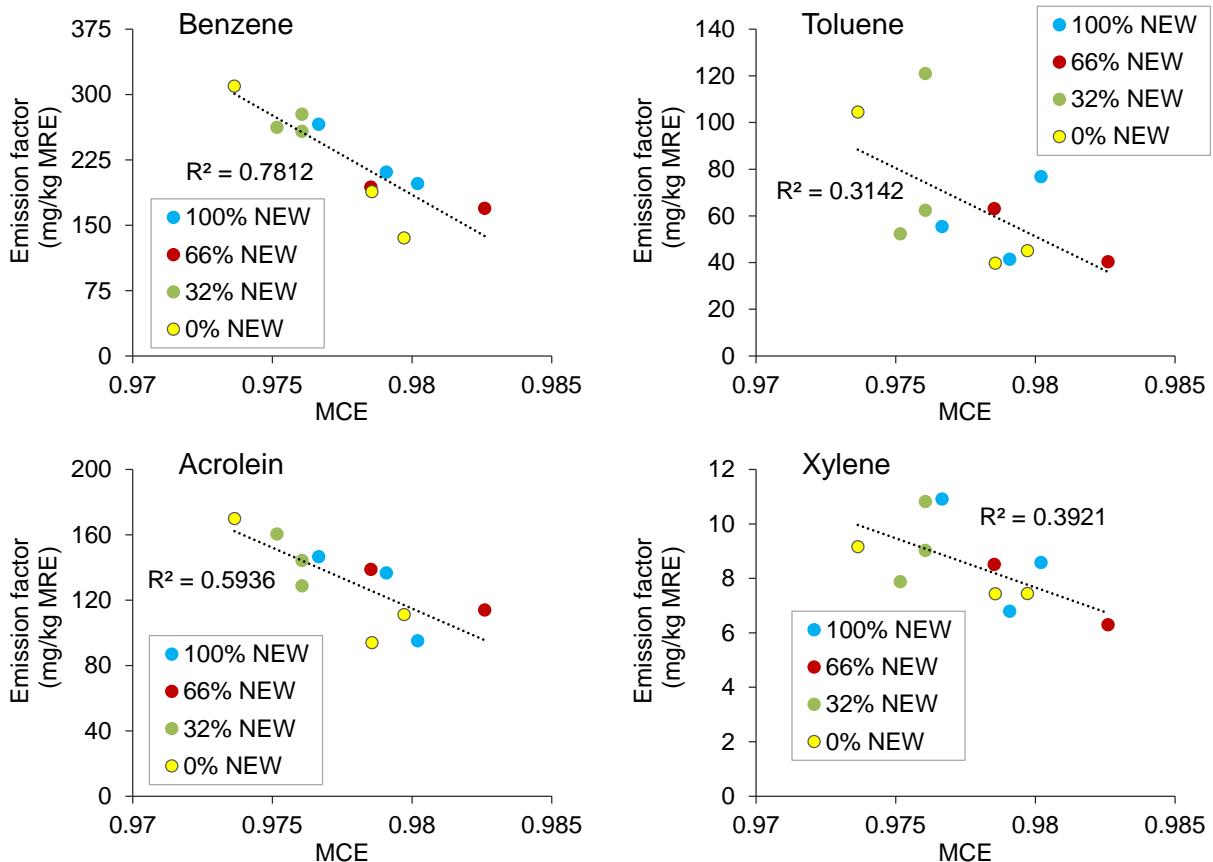
* = on EPA's list of Hazardous Air Pollutants (HAPs).

570

Table 3-4. VOC emission factors from open burning of MREs.

Compound	0 % NEW		32 % NEW		66 % NEW		100 % NEW	
	Average mg/kg	STDV mg/kg	Average mg/kg	STDV mg/kg	Average mg/kg	RPD mg/kg	Average mg/kg	STDV mg/kg
Benzene ^a	268	83	329	16	253	1.3%	286	75
Propene	211	89	266	10	182	6.7%	225	36
Vinyl Acetate ^a	101	41	111	24	93	17%	109	27
Acrolein ^a	125	40	145	16	126	10%	126	27
Toluene ^a	63	36	79	37	52	22%	58	18
1,3-Butadiene ^a	103	38	126	12	82	2.8%	94	55
Styrene ^a	206	192	283	198	210	10%	120	79
2-Butanone (MEK)	23	6.9	26	3.8	25	19%	24	7.8
Ethylbenzene ^a	16	12	24	14	18	1.8%	15	6.0
Methylene Chloride	5.4	0.66	6.0	0.93	4.8	15%	5.7	1.4
<i>m</i> , <i>p</i> -Xylenes ^a	2.7	0.36	3.2	0.56	2.6	15%	3.1	0.72
<i>o</i> -Xylene ^a	7.6	2.5	12	1.3	8.8	22%	13	1.9
Acetonitrile	0.95	0.69	1.5	0.89	1.2	5.1%	0.82	0.33
Cumene ^a	268	83	329	16	253	1.3%	286	75

^a Included in the EPA list of HAPs. The VOCs shown here were selected based on the number of compounds detectable above three times the detection limit and their relevance to the EPA's list of HAPs. Full list of the 88 VOCs analyzed and their emission factors are presented in Appendix B, Tables B20-24.



575 Figure 3-10. Select VOC emission factors versus modified combustion efficiency (MCE).

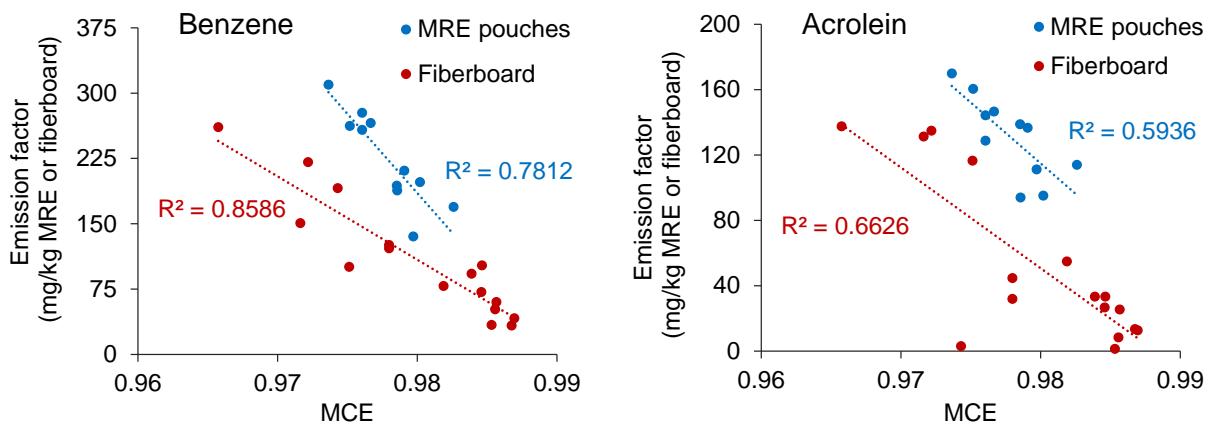


Figure 3-11. Benzene and acrolein vs. MCE for all MRE waste compositions and fiberboard types burns.

580 3.4 PAHs

3.4.1 Paperboard packaging

585

Fiberboard burns resulted in PAH emission factors as shown for sums (Figure 3-12), individual PAHs (Table 3-5), and TEF-weighted PAHs (Table 3-6). No difference was seen between the fiberboard types (Figure 3-12) (single factor ANOVA, $F = 0.51$, $p = 0.20$); PAH emissions are the same no matter what fiberboard type.

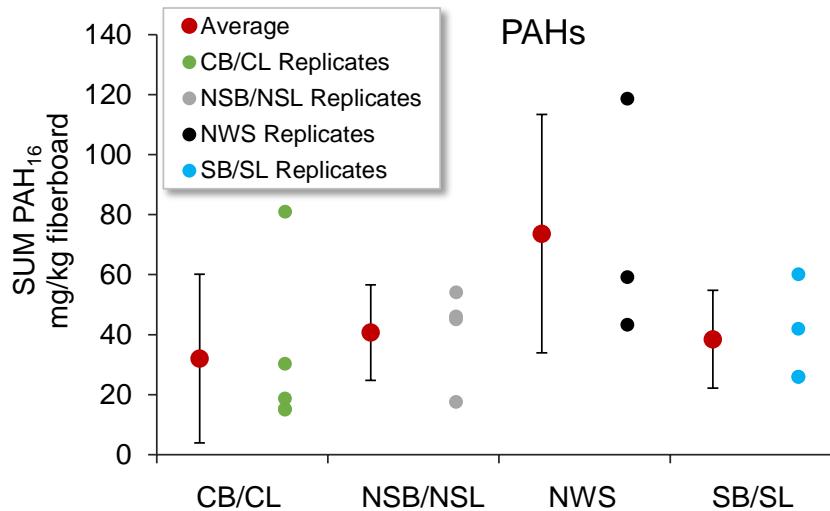


Figure 3-12. PAH emission factors from open burning of fiberboard packaging. Error bars represent 1 standard deviation.

590

Table 3-5. PAH emission factors from open burning of fiberboard in mg/kg fiberboard.

Compound	NWS		CB/CL		NSB/NSL		SB/SL	
	Average mg/kg Fiberboard	STDV						
Naphthalene	28	21	14	15	21	9.9	15	6.7
Acenaphthylene	13	9.3	5.5	5.2	6.9	2.7	4.8	2.2
Acenaphthene	0.68	0.45	0.24	0.18	0.43	0.19	0.35	0.20
Fluorene	3.0	1.6	1.1	0.86	1.4	0.56	1.8	0.79
Phenanthrene	10	4.7	4.3	3.0	4.4	1.3	6.8	3.0
Anthracene	2.4	1.3	0.89	0.64	0.99	0.33	1.7	0.87
Fluoranthene	4.9	2.7	2.0	0.93	1.8	0.29	2.7	1.2
Pyrene	4.5	2.5	1.8	0.80	1.7	0.24	2.4	1.1
Benzo(a)anthracene	1.2	0.65	0.44	0.27	0.44	0.13	0.75	0.35
Chrysene	1.1	0.57	0.43	0.28	0.41	0.11	0.72	0.34
Benzo(b)fluoranthene	0.62	0.32	0.24	0.14	0.23	0.068	0.33	0.16
Benzo(k)fluoranthene	0.91	0.45	0.31	0.18	0.27	0.055	0.40	0.17
Benzo(a)pyrene	1.0	0.55	0.34	0.22	0.31	0.067	0.46	0.22
Indeno(1,2,3-cd)pyrene	0.66	0.33	0.22	0.13	0.20	0.035	0.28	0.13
Dibenz(a,h)anthracene	0.11	0.067	0.041	0.030	0.037	0.011	0.067	0.038
Benzo(ghi)perylene	0.73	0.37	0.26	0.18	0.21	0.035	0.27	0.11
SUM 16-EPA PAH	74	40	32	28	41	16	38	16

Table 3-6. PAH TEQ emission factors from open burning of fiberboard in mg B[a]P TEQ/kg fiberboard.^a

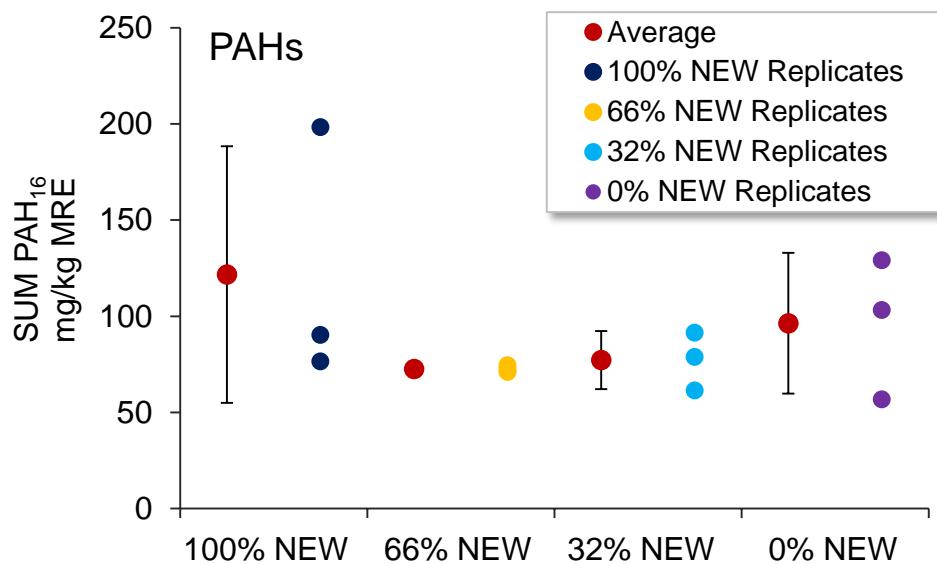
Compound	NWS		CB/CL		NSB/NSL		SB/SL	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
mg B[a]P TEQ/kg Fiberboard								
Naphthalene	NA							
Acenaphthylene	NA							
Acenaphthene	NA							
Fluorene	NA							
Phenanthrene	5.1E-03	2.4E-03	2.1E-03	1.5E-03	2.2E-03	6.4E-04	3.4E-03	1.5E-03
Anthracene	1.2E-03	6.3E-04	4.4E-04	3.2E-04	5.0E-04	1.6E-04	8.4E-04	4.3E-04
Fluoranthene	2.5E-01	1.3E-01	9.8E-02	4.6E-02	8.8E-02	1.4E-02	1.3E-01	5.9E-02
Pyrene	4.5E-03	2.5E-03	1.8E-03	8.0E-04	1.7E-03	2.4E-04	2.4E-03	1.1E-03
Benzo(a)anthracene	5.9E-03	3.3E-03	2.2E-03	1.4E-03	2.2E-03	6.3E-04	3.7E-03	1.7E-03
Chrysene	3.2E-02	1.7E-02	1.3E-02	8.4E-03	1.2E-02	3.3E-03	2.2E-02	1.0E-02
Benzo(b)fluoranthene	6.2E-02	3.2E-02	2.4E-02	1.4E-02	2.3E-02	6.8E-03	3.3E-02	1.6E-02
Benzo(k)fluoranthene	4.5E-02	2.3E-02	1.5E-02	9.2E-03	1.3E-02	2.7E-03	2.0E-02	8.3E-03
Benzo(a)pyrene	1.0E+00	5.5E-01	3.4E-01	2.2E-01	3.1E-01	6.7E-02	4.6E-01	2.2E-01
Indeno(1,2,3-cd)pyrene	6.6E-02	3.3E-02	2.2E-02	1.3E-02	2.0E-02	3.5E-03	2.8E-02	1.3E-02
Dibenz(a,h)anthracene	6.2E-02	7.3E-02	2.5E-02	1.8E-02	3.4E-02	2.4E-02	6.4E-02	5.5E-02
Benzo(ghi)perylene	1.5E-02	7.3E-03	5.3E-03	3.5E-03	4.2E-03	7.0E-04	5.4E-03	2.3E-03
SUM 16-EPA PAH	1.6E+00	8.2E-01	5.4E-01	3.1E-01	5.1E-01	1.2E-01	7.7E-01	3.8E-01

^aNA – not applicable (no TEF value).

595 3.4.2 *MRE pouches*

MRE burns resulted in PAH emission factors as shown for sums (Figure 3-13), individual PAHs (Table 3-7), and TEF-weighted PAHs (

Table 3-8). Single factor ANOVA ($F = 0.24$, $p = 0.44$) showed no difference in PAH emissions among the different MRE waste categories (Figure 3-13). However, a weak difference was seen between the
600 different MRE waste categories and CB/CL fiberboard type ($F = 1.04$, $p = 0.045$). Higher PAH emissions resulted from burning MREs and CB/CL together. No difference was seen between the MRE types (Figure 3-13); PAH emissions are the same no matter what MRE waste category.



605 Figure 3-13. PAH emission factors from open burning of MREs. Error bars represent 1 standard deviation.

Table 3-7. PAH emission factors from open burning of MRE pouches in mg/kg MRE.

Compound	0% New		32% New		66% New		100% New	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
	mg/kg MRE		mg/kg MRE		mg/kg MRE		mg/kg MRE	
Naphthalene	46	15	40	8.7	31	3.3	65	39
Acenaphthylene	15	5.7	12	2.1	11	1.3	19	9.8
Acenaphthene	0.69	0.25	0.58	0.14	0.57	0.011	0.87	0.57
Fluorene	4.5	1.9	3.2	0.47	3.5	0.68	4.8	2.6
Phenanthrene	16	7.0	11	1.95	14	3.3	16	7.3
Anthracene	2.5	1.0	2.0	0.38	2.3	0.36	2.9	1.5
Fluoranthene	3.2	1.4	2.4	0.37	2.9	0.029	3.7	1.4
Pyrene	2.2	1.0	1.9	0.39	2.1	0.18	2.9	1.3
Benzo(a)anthracene	1.3	0.65	0.82	0.20	1.09	0.023	1.4	0.69
Chrysene	1.5	0.79	0.99	0.22	1.37	0.021	1.5	0.75
Benzo(b)fluoranthene	0.91	0.45	0.57	0.14	0.77	0.016	0.85	0.45
Benzo(k)fluoranthene	0.83	0.47	0.60	0.11	0.72	0.104	0.89	0.36
Benzo(a)pyrene	0.79	0.43	0.56	0.14	0.65	0.079	0.86	0.44
Indeno(1,2,3-cd)pyrene	0.57	0.30	0.36	0.088	0.43	0.072	0.59	0.27
Dibenz(a,h)anthracene	0.21	0.110	0.115	0.031	0.138	0.0048	0.19	0.10
Benzo(ghi)perylene	0.50	0.25	0.37	0.10	0.37	0.111	0.58	0.27
SUM 16-EPA PAH	96	37	77	15	73	1.8	122	67

610 Table 3-8. PAH TEQ emission factors from open burning of MRE pouches in mg B[a]P TEQ/kg MRE.^a

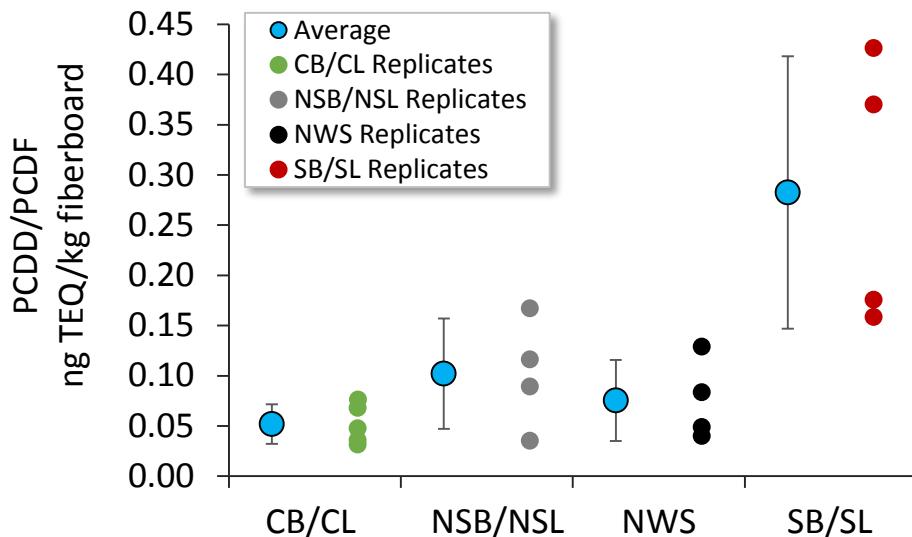
Compound	0% NEW		32% NEW		66% NEW		100% NEW	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
mg B[a]P TEQ/kg MRE								
Naphthalene	NA							
Acenaphthylene	NA							
Acenaphthene	NA							
Fluorene	NA							
Phenanthrene	7.9E-03	3.5E-03	5.6E-03	9.8E-04	6.9E-03	1.6E-03	8.2E-03	3.7E-03
Anthracene	1.3E-03	5.1E-04	9.9E-04	1.9E-04	1.2E-03	1.8E-04	1.5E-03	7.6E-04
Fluoranthene	1.6E-01	7.2E-02	1.2E-01	1.8E-02	1.5E-01	1.4E-03	1.8E-01	7.1E-02
Pyrene	2.2E-03	9.7E-04	1.9E-03	3.9E-04	2.1E-03	1.8E-04	2.9E-03	1.3E-03
Benzo(a)anthracene	6.3E-03	3.2E-03	4.1E-03	1.0E-03	5.5E-03	1.2E-04	6.8E-03	3.4E-03
Chrysene	4.5E-02	2.4E-02	3.0E-02	6.5E-03	4.1E-02	6.2E-04	4.6E-02	2.3E-02
Benzo(b)fluoranthene	9.1E-02	4.5E-02	5.7E-02	1.4E-02	7.7E-02	1.6E-03	8.5E-02	4.5E-02
Benzo(k)fluoranthene	4.1E-02	2.4E-02	3.0E-02	5.3E-03	3.6E-02	5.2E-03	4.4E-02	1.8E-02
Benzo(a)pyrene	7.9E-01	4.3E-01	5.6E-01	1.4E-01	6.5E-01	7.9E-02	8.6E-01	4.4E-01
Indeno(1,2,3-cd)pyrene	5.7E-02	3.0E-02	3.6E-02	8.8E-03	4.3E-02	7.2E-03	5.9E-02	2.7E-02
Dibenz(a,h)anthracene	2.3E-01	1.2E-01	1.3E-01	3.4E-02	1.5E-01	5.2E-03	2.1E-01	1.1E-01
Benzo(ghi)perylene	1.0E-02	4.9E-03	7.5E-03	2.1E-03	7.5E-03	2.2E-03	1.2E-02	5.5E-03
SUM 16-EPA PAH	1.4E+00	7.6E-01	9.8E-01	2.2E-01	1.2E+00	9.3E-02	1.5E+00	7.5E-01

^a NA – not applicable (no TEF value).

3.5 PCDD/PCDF

3.5.1 Fiberboard packaging

615 Emission values for the MRE shipping containers (Figure 3-14) show PCDD/PCDF emission factors that
are low compared to the cellulosic biomass [18]. One emission factor value, however, that of SB/SL,
stands out from the other fiberboard types as being distinctively high. Paired single factor ANOVA
analyses showed a significant difference between SB/SL and the other fiberboard types ($F = 1.43, 1.02,$
 2.61 and $p = 0.026, 0.048, 0.0065$). The same high value for SB/SL results when examining the
620 PCDD/PCDF total value (Table 3-10), consisting of the sum of all of the homolog concentrations. The
results are internally consistent in that the 1,2,3,7,8 – PeCDD congener and the 2,3,4,7,8 – PeCDF
congener consistently contribute the most to their respective TEQ values (Table 3-9). A number of
compositional factors (Table 2-1) may have resulted in this comparatively higher PCDD/PCDF value,
including lower calorific value, higher loss on drying, higher chloride, and lower sulfur. In general, better
625 combustion (processes with higher fuel calorific value and lower moisture content) results in lower
PCDD/PCDF formation due to the diminished availability of organic precursors. Higher chloride values
and lower sulfur values have generally been associated with increased formation of PCDD/PCDF, the
former acting as a chlorination promotor, and the latter acting to suppress PCDD/PCDF formation.



630 Figure 3-14. PCDD/PCDF emission factors from open burning of fiberboard packaging. Error bars represent 1 standard deviation.

Table 3-9. PCDD/PCDF TEQ emission factors.

Isomer.	CB/CL		NSB/NSL		NWS		SB/SL	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
ng TEQ/kg fiberboard								
2,3,7,8 - TCDD	3.20E-03	1.51E-03	1.25E-02	2.17E-03	6.05E-03	2.11E-03	2.76E-02	1.78E-02
1,2,3,7,8 - PeCDD	1.26E-02	3.95E-03	5.17E-02	2.36E-02	1.63E-02	7.55E-03	1.18E-01	8.06E-02
1,2,3,4,7,8 - HxCDD	8.22E-04	3.42E-04	2.78E-03	9.28E-04	1.06E-03	4.28E-04	6.70E-03	4.21E-03
1,2,3,6,7,8 - HxCDD	1.68E-03	4.09E-04	9.23E-03	3.54E-03	1.72E-03	7.64E-04	2.07E-02	1.25E-02
1,2,3,7,8,9 - HxCDD	1.40E-03	4.57E-04	6.74E-03	2.60E-03	1.52E-03	4.28E-04	1.54E-02	9.77E-03
1,2,3,4,6,7,8 - HpCDD	1.75E-03	4.93E-04	1.20E-02	3.91E-03	1.65E-03	4.17E-04	2.52E-02	1.19E-02
1,2,3,4,6,7,8,9 - OCDD	1.44E-04	3.82E-05	1.01E-03	2.52E-04	1.26E-04	4.01E-05	2.05E-03	7.88E-04
2,3,7,8 - TCDF	9.26E-03	6.22E-03	7.09E-03	1.13E-03	8.71E-03	4.93E-03	2.38E-02	4.96E-03
1,2,3,7,8 - PeCDF	9.13E-04	3.74E-04	5.70E-04	3.88E-04	1.38E-03	1.16E-03	2.03E-03	2.47E-04
2,3,4,7,8 - PeCDF	9.76E-03	3.25E-03	7.40E-03	5.07E-03	1.97E-02	1.30E-02	2.56E-02	2.47E-03
1,2,3,4,7,8 - HxCDF	2.72E-03	1.30E-03	2.63E-03	5.45E-04	5.66E-03	3.38E-03	4.52E-03	8.73E-04
1,2,3,6,7,8 - HxCDF	2.42E-03	1.26E-03	2.05E-03	6.52E-04	5.02E-03	3.58E-03	3.51E-03	2.94E-04
1,2,3,7,8,9 - HxCDF	1.30E-03	8.81E-04	7.22E-04	7.79E-05	2.26E-03	1.21E-03	1.39E-03	1.68E-04
2,3,4,6,7,8 - HxCDF	3.52E-03	2.73E-03	2.18E-03	4.74E-04	5.79E-03	2.59E-03	4.58E-03	6.47E-04
1,2,3,4,6,7,8 - HpCDF	8.86E-04	8.01E-04	6.68E-04	1.17E-04	1.23E-03	5.72E-04	1.23E-03	2.30E-04
1,2,3,4,7,8,9 - HpCDF	1.60E-04	1.43E-04	1.31E-04	3.58E-05	2.33E-04	1.66E-04	2.23E-04	7.03E-05
1,2,3,4,6,7,8,9 - OCDF	1.67E-05	1.46E-05	2.48E-05	5.44E-06	2.27E-05	1.23E-05	4.86E-05	9.76E-06
PCDD TEQ Total	2.09E-02	6.50E-03	7.92E-02	4.94E-02	2.54E-02	1.11E-02	2.16E-01	1.37E-01
PCDF TEQ Total	3.09E-02	1.36E-02	2.27E-02	5.70E-03	5.00E-02	2.95E-02	6.70E-02	6.04E-03
PCDD/PCDF TEQ Total	5.19E-02	1.97E-02	1.02E-01	5.50E-02	7.54E-02	4.05E-02	2.83E-01	1.36E-01

Table 3-10. PCDD/PCDF Total emission factors.

Homologue	CB/CL		NSB/NSL		NWS		SB/SL	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
ng/kg fiberboard								
TeCDD	0.35	0.089	0.39	0.13	0.39	0.12	0.84	0.40
PeCDD	0.18	0.040	0.31	0.17	0.20	0.033	0.80	0.47
HxCDD	0.19	0.060	0.67	0.30	0.19	0.016	1.7	1.0
HpCDD	0.31	0.10	1.9	0.65	0.29	0.071	4.0	1.9
OCDD	0.48	0.13	3.4	0.84	0.42	0.13	6.8	2.6
TeCDF	1.29	0.73	0.93	0.15	1.55	1.09	2.6	0.36
PeCDF	0.37	0.083	0.30	0.14	0.67	0.52	0.84	0.11
HxCDF	0.24	0.14	0.19	0.05	0.47	0.28	0.36	0.024
HpCDF	0.17	0.15	0.17	0.03	0.24	0.12	0.34	0.074
OCDF	0.069	0.043	0.086	0.023	0.076	0.041	0.16	0.033
PCDD Total	1.5	0.37	6.7	2.0	1.5	0.34	14	6.3
PCDF Total	2.1	0.84	1.7	0.30	3.0	2.0	4.3	0.48
PCDD/PCDF Total	3.6	1.2	8.3	2.2	4.5	2.2	19	6.6

635

Figure 3-15 compares the PCDD/PCDF TEQ values versus MCE, indicating a moderate, negatively correlating relationship. Formation of PCDD/PCDF has historically been tied to marginal combustion, likely due to the presence of surviving organic structures providing the template for chlorination and ring formation.

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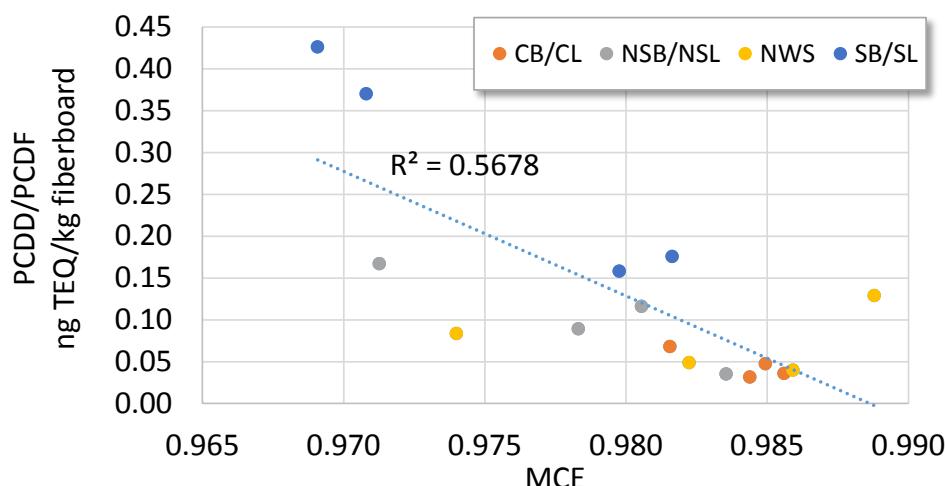


Figure 3-15. Fiberboard PCDD/PCDF emission factors versus modified combustion efficiency (MCE).

645 3.5.2 MRE pouches

PCDD/PCDF values are presented for the four compositions of MRE rations tested in Figure 3-16. There is considerable overlap in the ± 1 Std Dev range, although "0 % NEW" is the highest value. No statistical difference among the MRE waste compositions was found (single factor ANOVA $F = 0.77$, $p = 0.087$). The emission factors up to 2 ng TEQ/kg MRE are several times higher than the emission factors from the packing material alone (Figure 3-16), likely reflecting the more difficult combustion scenario (higher moisture, heterogeneity of packaging morphology) and the likely higher Cl content (food salts). The congener- and homolog-specific data are presented in Table 3-11 and Table 3-12, respectively. Figure 3-17 compares the PCDD/PCDF TEQ values versus MCE, indicating a weak negatively correlated relationship. Noticeable is that the MCE for the MRE tests are less than 0.960 while for fiberboard tests the MCE values are greater than 0.965.

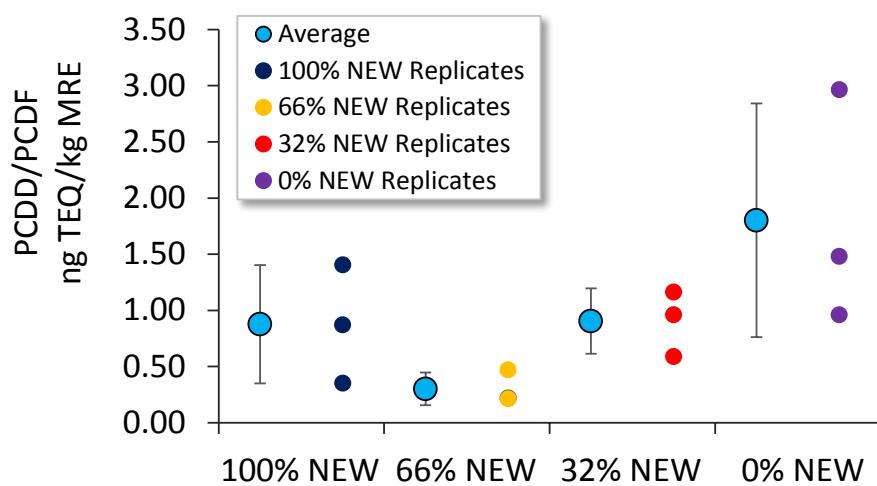


Figure 3-16. PCDD/PCDF emission factors from open burning of MREs. Error bars represent 1 standard deviation.

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665

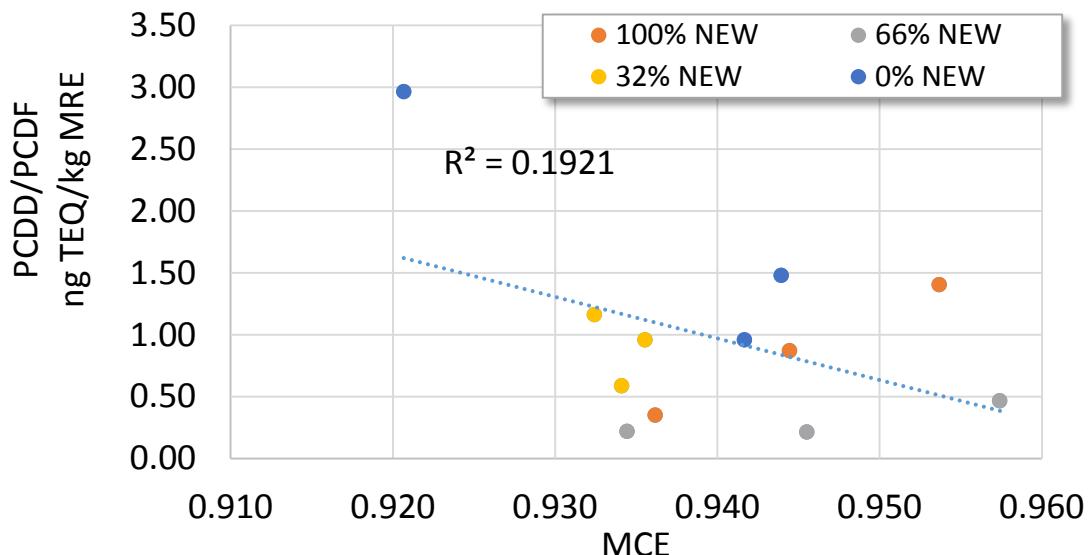
670

Table 3-11. PCDD/PCDF TEQ emission factors.

Isomer.	0% New		32% New		66% New		100% New	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
ng TEQ/kg MRE								
2,3,7,8 - TCDD	2.9E-01	2.4E-01	6.4E-02	3.5E-02	3.3E-02	2.1E-02	6.5E-02	4.2E-02
1,2,3,7,8 - PeCDD	1.3E-01	2.2E-02	8.8E-02	2.3E-02	3.6E-02	1.6E-02	8.6E-02	3.4E-02
1,2,3,4,7,8 - HxCDD	5.4E-03	2.1E-03	3.3E-03	1.1E-03	2.2E-03	4.1E-04	3.3E-03	1.3E-03
1,2,3,6,7,8 - HxCDD	7.2E-03	6.3E-03	7.8E-03	1.2E-03	6.4E-03	1.1E-03	8.0E-03	1.2E-03
1,2,3,7,8,9 - HxCDD	6.0E-03	5.3E-03	7.2E-03	2.0E-03	5.9E-03	8.6E-04	6.3E-03	5.4E-04
1,2,3,4,6,7,8 - HpCDD	1.2E-02	5.1E-04	8.8E-03	4.8E-04	9.0E-03	4.3E-04	9.8E-03	7.2E-04
1,2,3,4,6,7,8,9 - OCDD	9.9E-04	9.1E-05	7.5E-04	3.6E-05	8.1E-04	3.0E-05	8.7E-04	1.0E-04
2,3,7,8 - TCDF	7.1E-01	4.3E-01	3.4E-01	1.4E-01	9.7E-02	5.8E-02	3.3E-01	2.4E-01
1,2,3,7,8 - PeCDF	4.5E-02	2.4E-02	2.6E-02	7.8E-03	7.4E-03	4.7E-03	2.6E-02	1.7E-02
2,3,4,7,8 - PeCDF	4.8E-01	2.9E-01	2.6E-01	7.4E-02	7.5E-02	4.7E-02	2.5E-01	1.7E-01
1,2,3,4,7,8 - HxCDF	3.6E-02	9.2E-03	2.7E-02	8.4E-03	9.1E-03	3.0E-03	2.8E-02	1.2E-02
1,2,3,6,7,8 - HxCDF	3.2E-02	1.1E-02	2.7E-02	5.4E-03	8.6E-03	3.0E-03	2.4E-02	1.0E-02
1,2,3,7,8,9 - HxCDF	1.1E-02	1.0E-02	1.3E-02	5.5E-03	4.2E-03	1.9E-03	1.1E-02	4.2E-03
2,3,4,6,7,8 - HxCDF	2.7E-02	8.9E-03	2.4E-02	6.3E-03	8.6E-03	3.8E-03	2.1E-02	8.8E-03
1,2,3,4,6,7,8 - HpCDF	3.2E-03	1.3E-04	2.6E-03	6.2E-04	1.5E-03	2.5E-04	2.8E-03	8.6E-04
1,2,3,4,7,8,9 - HpCDF	3.9E-04	3.8E-04	7.4E-04	2.7E-04	2.5E-04	7.3E-05	6.4E-04	2.2E-04
1,2,3,4,6,7,8,9 - OCDF	7.1E-05	7.2E-06	6.3E-05	1.4E-05	4.8E-05	9.1E-06	6.0E-05	2.3E-05
PCDD TEQ Total	4.6E-01	2.6E-01	1.8E-01	5.0E-02	9.1E-02	2.9E-02	1.8E-01	7.5E-02
PCDF TEQ Total	1.3E+00	7.9E-01	7.2E-01	2.4E-01	2.1E-01	1.2E-01	7.0E-01	4.6E-01
PCDD/PCDF TEQ Total	1.8E+00	1.0E+00	9.0E-01	2.9E-01	3.0E-01	1.4E-01	8.8E-01	5.3E-01

Table 3-12. PCDD/PCDF Total emission factors.

Homologue	0 % New		32 % New		66 % New		100 % New	
	Average	STDV	Average	STDV	Average	STDV	Average	STDV
ng/kg MRE								
TeCDD	2.1	0.75	0.95	0.30	0.70	0.14	1.8	0.78
PeCDD	0.96	0.13	0.64	0.18	0.37	0.12	0.92	0.48
HxCDD	1.1	0.16	0.83	0.11	0.64	0.10	0.95	0.23
HpCDD	2.1	0.095	1.5	0.080	1.5	0.095	1.7	0.12
OCDD	3.31	0.30	2.48	0.12	2.71	0.10	2.90	0.34
TeCDF	92	48	57	15	26	8.0	59	25
PeCDF	14	6.5	9.0	2.2	2.4	1.2	8.6	5.3
HxCDF	2.4	0.85	2.0	0.43	0.66	0.25	1.9	0.75
HpCDF	0.49	0.16	0.50	0.14	0.25	0.017	0.44	0.069
OCDF	0.25	0.042	0.22	0.032	0.16	0.030	0.22	0.083
PCDD Total	9.6	0.96	6.4	0.51	5.9	0.52	8.2	1.6
PCDF Total	109	56	69	17	29	9.3	70	31
PCDD/PCDF Total	118	56	75	18	35	9.3	78	32



675 Figure 3-17. MRE PCDD/PCDF emission factors versus modified combustion efficiency (MCE).

4 Quality of Data and Data Limitations

For PCDD/PCDF analyses all surrogate standard recoveries were between 63% and 110% for the fiberboard burn samples, which was within the standard method criteria (25-130%). Some of 680 the surrogate standard recoveries were outside the standard method criteria (25-130%) for the MRE burn samples due to interference from significant amounts of other compounds in the ^{13}C channels causing a low response for the compound pre-analysis. For the PAHs all surrogate standard recoveries for method blanks and samples were between 48 and 110 percent, which was within the standard method criteria (25% and 130%). Two method blanks for the VOCs 685 returned all non-detects. All surrogate standard recoveries for method blanks and samples were between 95% and 107%, within the acceptance limits of the method (70-130%). Precision data on the XRF analyses for six elements had less than 3.5% error. The accuracy data on nine standard reference materials ranged from 90.7% to 106.8%. The precision for the gravimetric data is $\pm 10 \mu\text{g}$. The CO_2 calibration error for all test days was between 0.001% and 0.559%, and 690 the system drift was between 0.015 % and 0.319 %, below the error and drift acceptance criteria of 5% and 3%, respectively, in U.S. EPA Method 3A [14]. CO calibration and post drift tests were performed each test day. The calibration error for all test days was between 0.01 % and 1.10 %, and the system drift was between 0.66% and 1.57%, below the error and drift acceptance criteria of 5% and 3%, respectively, in U.S. EPA Method 3A [14].

695 As emission factors are often dependent on the type of material being burned and the method of burning, changes in composition and burn efficiency may change the emission factors determined herein.

5 Conclusions

Emissions from open burning of four MRE waste compositions and four MRE fiberboard packaging
700 containers were quantified for a range of emission types. MRE food packaging included current and prospective packing material (a nanocomposite polymer). Fiberboard packaging containers for 12 MREs consisted of current and prospective container material (cardboard and polymer-coated for wet strength).

All fiberboard packaging had low PCDD/PCDF emission factors, consistent with values for a range of
705 biomass types. The highest value, approximately three times higher than the other packaging types, was from the polymer-coated fiberboard packaging potentially due to minor changes in loss on drying, chloride, and sulfur content. A weak negative correlation with combustion efficiency was noted. PCDD/PCDF results from tests of four levels of old and new MRE packaging mixed in with the current fiberboard MRE containers increased levels up to six-fold from the containers alone. As well, emission
710 factors amongst the MRE compositions varied six-fold with no obvious relation to composition.

Average PAH results from the fiberboard containers varied between 30 and 75 mg/kg fiberboard. Addition of the MRE compositions to the baseline fiberboard more than doubled these values.

VOCs from burning fiberboard containers showed dominant benzene, acrolein, and toluene. The
715 containers with the polymer coating had two of the highest VOC concentrations but this was related to low MCE values; all of the VOC emission factors were negatively correlated with MCE and two polymer coated containers showed low VOC emissions at high MCE. Addition of MREs to the baseline packaging fiberboard showed little change in emission factors from those of the packaging alone.

PM emissions were 90 % less than 1 μm for fiberboard tests and tended to follow the combustion process and release of CO and CO₂. Little distinction was noted between the PM emission factors for the
720 four packaging types; no obvious relationship with MCE was observed. Addition of MRE pouches to the baseline fiberboard significantly increased the PM emission factors – approximately five- to six-fold.

In general, emissions tended to follow MCE – higher values of MCE associated with greater combustion efficiency led to lower emission factor values across all compositions tested. This suggests for this work
725 that attention to promoting improved combustion, rather than efforts to alter waste composition, was a more effective means of lowering emissions.

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Appendices

790 Appendix A: Data for each sample collected from Open Burning of Fiberboard.

Table A-1. PCDD/PCDF data for CB/CL 1.

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PCDD/PCDF				MCE	0.982
Sample ID	PS-PCDD-CB-SVOC-111814-02				
Sampling volume (m ³)	76.5				
Carbon sampled (g)	64.1				
Carbon sampled (mg/m ³)	837.4				
Carbon fraction	0.46245				

Isomer.	Total ng/sample	LOD ng/sample	TEQ	TEQ	Total ng/m³	TEQ ng/m³	TEQ ng/m³
			ng/sample ND = 0	ng/sample ND = LOD			
2,3,7,8 - TCDD	2.22E-04		2.22E-04	2.22E-04	2.90E-06	2.90E-06	2.90E-06
1,2,3,7,8 - PeCDD	2.00E-03		2.00E-03	2.00E-03	2.61E-05	2.61E-05	2.61E-05
1,2,3,4,7,8 - HxCDD	1.78E-03		1.78E-04	1.78E-04	2.32E-05	2.32E-06	2.32E-06
1,2,3,6,7,8 - HxCDD	3.11E-03		3.11E-04	3.11E-04	4.07E-05	4.07E-06	4.07E-06
1,2,3,7,8,9 - HxCDD	2.67E-03		2.67E-04	2.67E-04	3.49E-05	3.49E-06	3.49E-06
1,2,3,4,6,7,8 - HpCDD	3.00E-02		3.00E-04	3.00E-04	3.92E-04	3.92E-06	3.92E-06
1,2,3,4,6,7,8,9 - OCDD	7.24E-02		2.17E-05	2.17E-05	9.47E-04	2.84E-07	2.84E-07
2,3,7,8 - TCDF	1.02E-02		1.02E-03	1.02E-03	1.34E-04	1.34E-05	1.34E-05
1,2,3,7,8 - PeCDF	3.78E-03		1.13E-04	1.13E-04	4.94E-05	1.48E-06	1.48E-06
2,3,4,7,8 - PeCDF	6.22E-03		1.87E-03	1.87E-03	8.13E-05	2.44E-05	2.44E-05
1,2,3,4,7,8 - HxCDF	6.67E-03		6.67E-04	6.67E-04	8.71E-05	8.71E-06	8.71E-06
1,2,3,6,7,8 - HxCDF	6.00E-03		6.00E-04	6.00E-04	7.84E-05	7.84E-06	7.84E-06
1,2,3,7,8,9 - HxCDF	3.56E-03		3.56E-04	3.56E-04	4.65E-05	4.65E-06	4.65E-06
2,3,4,6,7,8 - HxCDF	1.13E-02		1.13E-03	1.13E-03	1.48E-04	1.48E-05	1.48E-05
1,2,3,4,6,7,8 - HpCDF	3.16E-02		3.16E-04	3.16E-04	4.12E-04	4.12E-06	4.12E-06
1,2,3,4,7,8,9 - HpCDF	4.89E-03		4.89E-05	4.89E-05	6.39E-05	6.39E-07	6.39E-07
1,2,3,4,6,7,8,9 - OCDF	1.84E-02		5.53E-06	5.53E-06	2.41E-04	7.23E-08	7.23E-08
TeCDD Total	4.51E-02				5.90E-04		
PeCDD Total	2.74E-02				3.58E-04		
HxCDD Total	2.78E-02				3.63E-04		
HpCDD Total	5.21E-02				6.81E-04		
OCDD	7.24E-02				9.46E-04		
TeCDF Total	1.58E-01				2.07E-03		
PeCDF Total	6.39E-02				8.35E-04		
HxCDF Total	6.50E-02				8.49E-04		
HpCDF Total	5.87E-02				7.67E-04		
OCDF	1.85E-02				2.41E-04		
PCDD Total	2.25E-01				2.94E-03		
PCDF Total	3.64E-01				4.76E-03		
PCDD/PCDF Total	5.89E-01				7.70E-03		
PCDD TEQ Total			3.30E-03	3.30E-03		4.31E-05	4.31E-05
PCDF TEQ Total			6.13E-03	6.13E-03		8.01E-05	8.01E-05
PCDD/PCDF TEQ Total			9.43E-03	9.43E-03		1.23E-04	1.23E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND=0	ND=LOD		ND=0	ND=LOD	
2,3,7,8 - TCDD	3.47E-06	3.47E-06	3.47E-06	1.60E-03	1.60E-03	1.60E-03
1,2,3,7,8 - PeCDD	3.12E-05	3.12E-05	3.12E-05	1.44E-02	1.44E-02	1.44E-02
1,2,3,4,7,8 - HxCDD	2.77E-05	2.77E-06	2.77E-06	1.28E-02	1.28E-03	1.28E-03
1,2,3,6,7,8 - HxCDD	4.86E-05	4.86E-06	4.86E-06	2.25E-02	2.25E-03	2.25E-03
1,2,3,7,8,9 - HxCDD	4.16E-05	4.16E-06	4.16E-06	1.92E-02	1.92E-03	1.92E-03
1,2,3,4,6,7,8 - HpCDD	4.68E-04	4.68E-06	4.68E-06	2.17E-01	2.17E-03	2.17E-03
1,2,3,4,6,7,8,9 - OCDD	1.13E-03	3.39E-07	3.39E-07	5.23E-01	1.57E-04	1.57E-04
2,3,7,8 - TCDF	1.60E-04	1.60E-05	1.60E-05	7.38E-02	7.38E-03	7.38E-03
1,2,3,7,8 - PeCDF	5.90E-05	1.77E-06	1.77E-06	2.73E-02	8.18E-04	8.18E-04
2,3,4,7,8 - PeCDF	9.71E-05	2.91E-05	2.91E-05	4.49E-02	1.35E-02	1.35E-02
1,2,3,4,7,8 - HxCDF	1.04E-04	1.04E-05	1.04E-05	4.81E-02	4.81E-03	4.81E-03
1,2,3,6,7,8 - HxCDF	9.36E-05	9.36E-06	9.36E-06	4.33E-02	4.33E-03	4.33E-03
1,2,3,7,8,9 - HxCDF	5.55E-05	5.55E-06	5.55E-06	2.57E-02	2.57E-03	2.57E-03
2,3,4,6,7,8 - HxCDF	1.77E-04	1.77E-05	1.77E-05	8.18E-02	8.18E-03	8.18E-03
1,2,3,4,6,7,8 - HpCDF	4.92E-04	4.92E-06	4.92E-06	2.28E-01	2.28E-03	2.28E-03
1,2,3,4,7,8,9 - HpCDF	7.63E-05	7.63E-07	7.63E-07	3.53E-02	3.53E-04	3.53E-04
1,2,3,4,6,7,8,9 - OCDF	2.88E-04	8.64E-08	8.64E-08	1.33E-01	3.99E-05	3.99E-05
TeCDD Total	7.04E-04			3.26E-01		
PeCDD Total	4.27E-04			1.97E-01		
HxCDD Total	4.34E-04			2.00E-01		
HpCDD Total	8.13E-04			3.76E-01		
OCDD	1.13E-03			5.23E-01		
TeCDF Total	2.47E-03			1.14E+00		
PeCDF Total	9.97E-04			4.61E-01		
HxCDF Total	1.01E-03			4.69E-01		
HpCDF Total	9.16E-04			4.23E-01		
OCDF	2.88E-04			1.33E-01		
PCDD Total	3.51E-03			1.62E+00		
PCDF Total	5.69E-03			2.63E+00		
PCDD/PCDF Total	9.20E-03			4.25E+00		
PCDD TEQ Total		5.15E-05	5.15E-05		2.38E-02	2.38E-02
PCDF TEQ Total		9.56E-05	9.56E-05		4.42E-02	4.42E-02
PCDD/PCDF TEQ Total		1.47E-04	1.47E-04		6.80E-02	6.80E-02

Table A-2. PCDD/PCDF data for CB/CL 2.

Page 1 (2)

PCDD/PCDF					
Sample ID		PS-PCDD-CB2-SVOC-111914-02		MCE	0.984
Sampling volume (m ³)	62.8				
Carbon sampled (g)	73.1				
Carbon sampled (mg/m ³)	1164.9				
Carbon fraction	0.4625				

Isomer.	Total ng/sample	LOD ng/sample	TEQ	TEQ	Total	TEQ	TEQ
			ng/sample	ND = 0	ng/m ³	ng/m ³	ND = LOD
2,3,7,8 - TCDD	4.44E-04		4.44E-04	4.44E-04	7.08E-06	7.08E-06	7.08E-06
1,2,3,7,8 - PeCDD	1.11E-03		1.11E-03	1.11E-03	1.77E-05	1.77E-05	1.77E-05
1,2,3,4,7,8 - HxCDD	6.67E-04		6.67E-05	6.67E-05	1.06E-05	1.06E-06	1.06E-06
1,2,3,6,7,8 - HxCDD	1.78E-03		1.78E-04	1.78E-04	2.83E-05	2.83E-06	2.83E-06
1,2,3,7,8,9 - HxCDD	1.78E-03		1.78E-04	1.78E-04	2.83E-05	2.83E-06	2.83E-06
1,2,3,4,6,7,8 - HpCDD	2.22E-02		2.22E-04	2.22E-04	3.54E-04	3.54E-06	3.54E-06
1,2,3,4,6,7,8,9 - OCDD	5.96E-02		1.79E-05	1.79E-05	9.49E-04	2.85E-07	2.85E-07
2,3,7,8 - TCDF	1.00E-02		1.00E-03	1.00E-03	1.59E-04	1.59E-05	1.59E-05
1,2,3,7,8 - PeCDF	3.33E-03		1.00E-04	1.00E-04	5.31E-05	1.59E-06	1.59E-06
2,3,4,7,8 - PeCDF	3.11E-03		9.33E-04	9.33E-04	4.96E-05	1.49E-05	1.49E-05
1,2,3,4,7,8 - HxCDF	2.22E-03		2.22E-04	2.22E-04	3.54E-05	3.54E-06	3.54E-06
1,2,3,6,7,8 - HxCDF	1.56E-03		1.56E-04	1.56E-04	2.48E-05	2.48E-06	2.48E-06
1,2,3,7,8,9 - HxCDF	6.67E-04		6.67E-05	6.67E-05	1.06E-05	1.06E-06	1.06E-06
2,3,4,6,7,8 - HxCDF	2.22E-03		2.22E-04	2.22E-04	3.54E-05	3.54E-06	3.54E-06
1,2,3,4,6,7,8 - HpCDF	5.11E-03		5.11E-05	5.11E-05	8.14E-05	8.14E-07	8.14E-07
1,2,3,4,7,8,9 - HpCDF	6.67E-04		6.67E-06	6.67E-06	1.06E-05	1.06E-07	1.06E-07
1,2,3,4,6,7,8,9 - OCDF	6.00E-03		1.80E-06	1.80E-06	9.56E-05	2.87E-08	2.87E-08
TeCDD Total	4.00E-02				6.37E-04		
PeCDD Total	1.93E-02				3.07E-04		
HxCDD Total	2.10E-02				3.34E-04		
HpCDD Total	3.63E-02				5.79E-04		
OCDD	5.96E-02				9.50E-04		
TeCDF Total	1.29E-01				2.06E-03		
PeCDF Total	3.96E-02				6.31E-04		
HxCDF Total	1.38E-02				2.20E-04		
HpCDF Total	1.14E-02				1.82E-04		
OCDF	6.04E-03				9.63E-05		
PCDD Total	1.76E-01				2.81E-03		
PCDF Total	2.00E-01				3.19E-03		
PCDD/PCDF Total	3.76E-01				6.00E-03		
PCDD TEQ Total			2.22E-03	2.22E-03		3.53E-05	3.53E-05
PCDF TEQ Total			2.76E-03	2.76E-03		4.40E-05	4.40E-05
PCDD/PCDF TEQ Total	4.98E-03		4.98E-03	4.98E-03		7.93E-05	7.93E-05

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fiberboard		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	6.08E-06	6.08E-06	6.08E-06	2.81E-03	2.81E-03	2.81E-03
1,2,3,7,8 - PeCDD	1.52E-05	1.52E-05	1.52E-05	7.03E-03	7.03E-03	7.03E-03
1,2,3,4,7,8 - HxCDD	9.12E-06	9.12E-07	9.12E-07	4.22E-03	4.22E-04	4.22E-04
1,2,3,6,7,8 - HxCDD	2.43E-05	2.43E-06	2.43E-06	1.12E-02	1.12E-03	1.12E-03
1,2,3,7,8,9 - HxCDD	2.43E-05	2.43E-06	2.43E-06	1.12E-02	1.12E-03	1.12E-03
1,2,3,4,6,7,8 - HpCDD	3.04E-04	3.04E-06	3.04E-06	1.41E-01	1.41E-03	1.41E-03
1,2,3,4,6,7,8,9 - OCDD	8.15E-04	2.44E-07	2.44E-07	3.77E-01	1.13E-04	1.13E-04
2,3,7,8 - TCDF	1.37E-04	1.37E-05	1.37E-05	6.32E-02	6.32E-03	6.32E-03
1,2,3,7,8 - PeCDF	4.56E-05	1.37E-06	1.37E-06	2.11E-02	6.32E-04	6.32E-04
2,3,4,7,8 - PeCDF	4.26E-05	1.28E-05	1.28E-05	1.97E-02	5.90E-03	5.90E-03
1,2,3,4,7,8 - HxCDF	3.04E-05	3.04E-06	3.04E-06	1.41E-02	1.41E-03	1.41E-03
1,2,3,6,7,8 - HxCDF	2.13E-05	2.13E-06	2.13E-06	9.84E-03	9.84E-04	9.84E-04
1,2,3,7,8,9 - HxCDF	9.12E-06	9.12E-07	9.12E-07	4.22E-03	4.22E-04	4.22E-04
2,3,4,6,7,8 - HxCDF	3.04E-05	3.04E-06	3.04E-06	1.41E-02	1.41E-03	1.41E-03
1,2,3,4,6,7,8 - HpCDF	6.99E-05	6.99E-07	6.99E-07	3.23E-02	3.23E-04	3.23E-04
1,2,3,4,7,8,9 - HpCDF	9.12E-06	9.12E-08	9.12E-08	4.22E-03	4.22E-05	4.22E-05
1,2,3,4,6,7,8,9 - OCDF	8.21E-05	2.46E-08	2.46E-08	3.79E-02	1.14E-05	1.14E-05
TeCDD Total	5.46E-04			2.53E-01		
PeCDD Total	2.64E-04			1.22E-01		
HxCDD Total	2.87E-04			1.33E-01		
HpCDD Total	4.97E-04			2.30E-01		
OCDD	8.15E-04			3.77E-01		
TeCDF Total	1.77E-03			8.18E-01		
PeCDF Total	5.42E-04			2.51E-01		
HxCDF Total	1.89E-04			8.74E-02		
HpCDF Total	1.57E-04			7.24E-02		
OCDF	8.27E-05			3.82E-02		
PCDD Total	2.41E-03			1.11E+00		
PCDF Total	2.74E-03			1.27E+00		
PCDD/PCDF Total	5.15E-03			2.38E+00		
PCDD TEQ Total		3.03E-05	3.03E-05		1.40E-02	1.40E-02
PCDF TEQ Total		3.77E-05	3.77E-05		1.75E-02	1.75E-02
PCDD/PCDF TEQ Total		6.81E-05	6.81E-05		3.15E-02	3.15E-02

Table A-3. PCDD/PCDF data for CB/CL 3.

PCDD/PCDF						Page 1 (2)	
Sample ID		PS-PCDD-CB3-SVOC-112014-02		MCE	0.985		
Sampling volume (m ³)	60.5						
Carbon sampled (g)	65.0						
Carbon sampled (mg/m ³)	1074.5						
Carbon fraction	0.4625						

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m ³	TEQ ng/m ³ ND = 0	TEQ ng/m ³ ND = LOD
2,3,7,8 - TCDD	4.44E-04		4.44E-04	4.44E-04	7.34E-06	7.34E-06	7.34E-06
1,2,3,7,8 - PeCDD	2.00E-03		2.00E-03	2.00E-03	3.30E-05	3.30E-05	3.30E-05
1,2,3,4,7,8 - HxCDD	8.89E-04		8.89E-05	8.89E-05	1.47E-05	1.47E-06	1.47E-06
1,2,3,6,7,8 - HxCDD	2.22E-03		2.22E-04	2.22E-04	3.67E-05	3.67E-06	3.67E-06
1,2,3,7,8,9 - HxCDD	1.78E-03		1.78E-04	1.78E-04	2.94E-05	2.94E-06	2.94E-06
1,2,3,4,6,7,8 - HpCDD	1.93E-02		1.93E-04	1.93E-04	3.19E-04	3.19E-06	3.19E-06
1,2,3,4,6,7,8,9 - OCDD	5.82E-02		1.75E-05	1.75E-05	9.62E-04	2.89E-07	2.89E-07
2,3,7,8 - TCDF	1.02E-02		1.02E-03	1.02E-03	1.69E-04	1.69E-05	1.69E-05
1,2,3,7,8 - PeCDF	3.78E-03		1.13E-04	1.13E-04	6.24E-05	1.87E-06	1.87E-06
2,3,4,7,8 - PeCDF	4.44E-03		1.33E-03	1.33E-03	7.34E-05	2.20E-05	2.20E-05
1,2,3,4,7,8 - HxCDF	3.33E-03		3.33E-04	3.33E-04	5.51E-05	5.51E-06	5.51E-06
1,2,3,6,7,8 - HxCDF	2.67E-03		2.67E-04	2.67E-04	4.41E-05	4.41E-06	4.41E-06
1,2,3,7,8,9 - HxCDF	1.11E-03		1.11E-04	1.11E-04	1.84E-05	1.84E-06	1.84E-06
2,3,4,6,7,8 - HxCDF	2.89E-03		2.89E-04	2.89E-04	4.77E-05	4.77E-06	4.77E-06
1,2,3,4,6,7,8 - HpCDF	6.67E-03		6.67E-05	6.67E-05	1.10E-04	1.10E-06	1.10E-06
1,2,3,4,7,8,9 - HpCDF	8.89E-04		8.89E-06	8.89E-06	1.47E-05	1.47E-07	1.47E-07
1,2,3,4,6,7,8,9 - OCDF	7.11E-03		2.13E-06	2.13E-06	1.17E-04	3.52E-08	3.52E-08
TeCDD Total	5.61E-02				9.27E-04		
PeCDD Total	3.18E-02				5.25E-04		
HxCDD Total	2.64E-02				4.36E-04		
HpCDD Total	3.58E-02				5.92E-04		
OCDD	5.81E-02				9.60E-04		
TeCDF Total	1.57E-01				2.59E-03		
PeCDF Total	6.09E-02				1.01E-03		
HxCDF Total	2.64E-02				4.37E-04		
HpCDF Total	1.39E-02				2.29E-04		
OCDF	7.00E-03				1.16E-04		
PCDD Total	2.08E-01				3.44E-03		
PCDF Total	2.65E-01				4.38E-03		
PCDD/PCDF Total	4.73E-01				7.82E-03		
PCDD TEQ Total			3.14E-03	3.14E-03		5.19E-05	5.19E-05
PCDF TEQ Total			3.55E-03	3.55E-03		5.86E-05	5.86E-05
PCDD/PCDF TEQ Total	6.69E-03	6.69E-03				1.11E-04	1.11E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon	ng/g Carbon	ng/g Carbon	ng/kg fiberboard		
		ND = 0	ND = LOD		ND = 0	ND = LOD
2,3,7,8 - TCDD	6.83E-06	6.83E-06	6.83E-06	3.16E-03	3.16E-03	3.16E-03
1,2,3,7,8 - PeCDD	3.08E-05	3.08E-05	3.08E-05	1.42E-02	1.42E-02	1.42E-02
1,2,3,4,7,8 - HxCDD	1.37E-05	1.37E-06	1.37E-06	6.32E-03	6.32E-04	6.32E-04
1,2,3,6,7,8 - HxCDD	3.42E-05	3.42E-06	3.42E-06	1.58E-02	1.58E-03	1.58E-03
1,2,3,7,8,9 - HxCDD	2.73E-05	2.73E-06	2.73E-06	1.26E-02	1.26E-03	1.26E-03
1,2,3,4,6,7,8 - HpCDD	2.97E-04	2.97E-06	2.97E-06	1.37E-01	1.37E-03	1.37E-03
1,2,3,4,6,7,8,9 - OCDD	8.95E-04	2.69E-07	2.69E-07	4.14E-01	1.24E-04	1.24E-04
2,3,7,8 - TCDF	1.57E-04	1.57E-05	1.57E-05	7.27E-02	7.27E-03	7.27E-03
1,2,3,7,8 - PeCDF	5.81E-05	1.74E-06	1.74E-06	2.69E-02	8.06E-04	8.06E-04
2,3,4,7,8 - PeCDF	6.83E-05	2.05E-05	2.05E-05	3.16E-02	9.48E-03	9.48E-03
1,2,3,4,7,8 - HxCDF	5.13E-05	5.13E-06	5.13E-06	2.37E-02	2.37E-03	2.37E-03
1,2,3,6,7,8 - HxCDF	4.10E-05	4.10E-06	4.10E-06	1.90E-02	1.90E-03	1.90E-03
1,2,3,7,8,9 - HxCDF	1.71E-05	1.71E-06	1.71E-06	7.90E-03	7.90E-04	7.90E-04
2,3,4,6,7,8 - HxCDF	4.44E-05	4.44E-06	4.44E-06	2.05E-02	2.05E-03	2.05E-03
1,2,3,4,6,7,8 - HpCDF	1.03E-04	1.03E-06	1.03E-06	4.74E-02	4.74E-04	4.74E-04
1,2,3,4,7,8,9 - HpCDF	1.37E-05	1.37E-07	1.37E-07	6.32E-03	6.32E-05	6.32E-05
1,2,3,4,6,7,8,9 - OCDF	1.09E-04	3.28E-08	3.28E-08	5.06E-02	1.52E-05	1.52E-05
TeCDD Total	8.63E-04			3.99E-01		
PeCDD Total	4.89E-04			2.26E-01		
HxCDD Total	4.06E-04			1.88E-01		
HpCDD Total	5.51E-04			2.55E-01		
OCDD	8.94E-04			4.13E-01		
TeCDF Total	2.41E-03			1.12E+00		
PeCDF Total	9.36E-04			4.33E-01		
HxCDF Total	4.06E-04			1.88E-01		
HpCDF Total	2.13E-04			9.86E-02		
OCDF	1.08E-04			4.98E-02		
PCDD Total	3.20E-03			1.48E+00		
PCDF Total	4.08E-03			1.88E+00		
PCDD/PCDF Total	7.28E-03			3.37E+00		
PCDD TEQ Total		4.83E-05	4.83E-05		2.24E-02	2.24E-02
PCDF TEQ Total		5.45E-05	5.45E-05		2.52E-02	2.52E-02
PCDD/PCDF TEQ Total		1.03E-04	1.03E-04		4.76E-02	4.76E-02

Table A-4. PCDD/PCDF data for CB/CL 4.

Sample ID PS-PCDD-CB4-SVOC-112114-01
 Sampling volume (m³) 60.5
 Carbon sampled (g) 70.9
 Carbon sampled (mg/m³) 1172.0
 Carbon fraction 0.4625

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample	ND = 0	ng/m ³	ng/m ³	ng/m ³
2,3,7,8 - TCDD	ND	7.56E-04	0.00E+00	7.56E-04	ND	0.00E+00	1.25E-05
1,2,3,7,8 - PeCDD	1.56E-03		1.56E-03	1.56E-03	2.57E-05	2.57E-05	2.57E-05
1,2,3,4,7,8 - HxCDD	1.11E-03		1.11E-04	1.11E-04	1.84E-05	1.84E-06	1.84E-06
1,2,3,6,7,8 - HxCDD	2.44E-03		2.44E-04	2.44E-04	4.04E-05	4.04E-06	4.04E-06
1,2,3,7,8,9 - HxCDD	1.33E-03		1.33E-04	1.33E-04	2.20E-05	2.20E-06	2.20E-06
1,2,3,4,6,7,8 - HpCDD	2.18E-02		2.18E-04	2.18E-04	3.60E-04	3.60E-06	3.60E-06
1,2,3,4,6,7,8,9 - OCDD	6.13E-02		1.84E-05	1.84E-05	1.01E-03	3.04E-07	3.04E-07
2,3,7,8 - TCDF	7.78E-03		7.78E-04	7.78E-04	1.29E-04	1.29E-05	1.29E-05
1,2,3,7,8 - PeCDF	3.78E-03		1.13E-04	1.13E-04	6.24E-05	1.87E-06	1.87E-06
2,3,4,7,8 - PeCDF	3.78E-03		1.13E-03	1.13E-03	6.24E-05	1.87E-05	1.87E-05
1,2,3,4,7,8 - HxCDF	3.11E-03		3.11E-04	3.11E-04	5.14E-05	5.14E-06	5.14E-06
1,2,3,6,7,8 - HxCDF	3.11E-03		3.11E-04	3.11E-04	5.14E-05	5.14E-06	5.14E-06
1,2,3,7,8,9 - HxCDF	1.33E-03		1.33E-04	1.33E-04	2.20E-05	2.20E-06	2.20E-06
2,3,4,6,7,8 - HxCDF	3.56E-03		3.56E-04	3.56E-04	5.88E-05	5.88E-06	5.88E-06
1,2,3,4,6,7,8 - HpCDF	7.78E-03		7.78E-05	7.78E-05	1.29E-04	1.29E-06	1.29E-06
1,2,3,4,7,8,9 - HpCDF	ND	9.11E-04	0.00E+00	9.11E-06	ND	0.00E+00	1.51E-07
1,2,3,4,6,7,8,9 - OCDF	8.67E-03		2.60E-06	2.60E-06	1.43E-04	4.30E-08	4.30E-08
TeCDD Total	4.63E-02				7.65E-04		
PeCDD Total	3.15E-02				5.21E-04		
HxCDD Total	2.46E-02				4.07E-04		
HpCDD Total	3.87E-02				6.40E-04		
OCDD	6.14E-02				1.01E-03		
TeCDF Total	1.22E-01				2.02E-03		
PeCDF Total	5.53E-02				9.13E-04		
HxCDF Total	2.65E-02				4.37E-04		
HpCDF Total	1.36E-02				2.24E-04		
OCDF	8.56E-03				1.41E-04		
PCDD Total	2.03E-01				3.35E-03		
PCDF Total	2.26E-01				3.74E-03		
PCDD/PCDF Total	4.29E-01				7.09E-03		
PCDD TEQ Total			2.28E-03	3.04E-03		3.77E-05	5.02E-05
PCDF TEQ Total			3.22E-03	3.23E-03		5.31E-05	5.33E-05
PCDD/PCDF TEQ Total			5.50E-03	6.26E-03		9.08E-05	1.03E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	ND	0.00E+00	1.07E-05	ND	0.00E+00	4.93E-03
1,2,3,7,8 - PeCDD	2.19E-05	2.19E-05	2.19E-05	1.01E-02	1.01E-02	1.01E-02
1,2,3,4,7,8 - HxCDD	1.57E-05	1.57E-06	1.57E-06	7.25E-03	7.25E-04	7.25E-04
1,2,3,6,7,8 - HxCDD	3.45E-05	3.45E-06	3.45E-06	1.59E-02	1.59E-03	1.59E-03
1,2,3,7,8,9 - HxCDD	1.88E-05	1.88E-06	1.88E-06	8.69E-03	8.69E-04	8.69E-04
1,2,3,4,6,7,8 - HpCDD	3.07E-04	3.07E-06	3.07E-06	1.42E-01	1.42E-03	1.42E-03
1,2,3,4,6,7,8,9 - OCDD	8.65E-04	2.59E-07	2.59E-07	4.00E-01	1.20E-04	1.20E-04
2,3,7,8 - TCDF	1.10E-04	1.10E-05	1.10E-05	5.07E-02	5.07E-03	5.07E-03
1,2,3,7,8 - PeCDF	5.33E-05	1.60E-06	1.60E-06	2.46E-02	7.39E-04	7.39E-04
2,3,4,7,8 - PeCDF	5.33E-05	1.60E-05	1.60E-05	2.46E-02	7.39E-03	7.39E-03
1,2,3,4,7,8 - HxCDF	4.39E-05	4.39E-06	4.39E-06	2.03E-02	2.03E-03	2.03E-03
1,2,3,6,7,8 - HxCDF	4.39E-05	4.39E-06	4.39E-06	2.03E-02	2.03E-03	2.03E-03
1,2,3,7,8,9 - HxCDF	1.88E-05	1.88E-06	1.88E-06	8.69E-03	8.69E-04	8.69E-04
2,3,4,6,7,8 - HxCDF	5.01E-05	5.01E-06	5.01E-06	2.32E-02	2.32E-03	2.32E-03
1,2,3,4,6,7,8 - HpCDF	1.10E-04	1.10E-06	1.10E-06	5.07E-02	5.07E-04	5.07E-04
1,2,3,4,7,8,9 - HpCDF	ND	0.00E+00	1.28E-07	ND	0.00E+00	5.94E-05
1,2,3,4,6,7,8,9 - OCDF	1.22E-04	3.67E-08	3.67E-08	5.65E-02	1.70E-05	1.70E-05
TeCDD Total	6.53E-04			3.02E-01		
PeCDD Total	4.45E-04			2.06E-01		
HxCDD Total	3.47E-04			1.61E-01		
HpCDD Total	5.46E-04			2.52E-01		
OCDD	8.66E-04			4.00E-01		
TeCDF Total	1.73E-03			7.98E-01		
PeCDF Total	7.79E-04			3.60E-01		
HxCDF Total	3.73E-04			1.73E-01		
HpCDF Total	1.91E-04			8.84E-02		
OCDF	1.21E-04			5.58E-02		
PCDD Total	2.86E-03			1.32E+00		
PCDF Total	3.19E-03			1.47E+00		
PCDD/PCDF Total	6.05E-03			2.80E+00		
PCDD TEQ Total		3.22E-05	4.28E-05		1.49E-02	1.98E-02
PCDF TEQ Total		4.53E-05	4.55E-05		2.10E-02	2.10E-02
PCDD/PCDF TEQ Total		7.75E-05	8.83E-05		3.58E-02	4.08E-02

800 Table A-5. PCDD/PCDF data for NSB/NSL 1.

PCDD/PCDF

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Sample ID	PS-PCDD-NSB-SVOC-111914-02	MCE	0.984
Sampling volume (m ³)	45.3		
Carbon sampled (g)	65.2		
Carbon sampled (mg/m ³)	1438.8		
Carbon fraction	0.4561		

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m ³	TEQ ng/m ³ ND = 0	TEQ ng/m ³ ND = LOD
2,3,7,8 - TCDD	ND	2.58E-03	0.00E+00	2.58E-03	ND	0.00E+00	5.69E-05
1,2,3,7,8 - PeCDD	ND	5.18E-03	0.00E+00	5.18E-03	ND	0.00E+00	1.14E-04
1,2,3,4,7,8 - HxCDD	ND	4.29E-03	0.00E+00	4.29E-04	ND	0.00E+00	9.46E-06
1,2,3,6,7,8 - HxCDD	8.67E-03		8.67E-04	8.67E-04	1.91E-04	1.91E-05	1.91E-05
1,2,3,7,8,9 - HxCDD	6.44E-03		6.44E-04	6.44E-04	1.42E-04	1.42E-05	1.42E-05
1,2,3,4,6,7,8 - HpCDD	1.20E-01		1.20E-03	1.20E-03	2.64E-03	2.64E-05	2.64E-05
1,2,3,4,6,7,8,9 - OCDD	3.96E-01		1.19E-04	1.19E-04	8.74E-03	2.62E-06	2.62E-06
2,3,7,8 - TCDF	1.20E-02		1.20E-03	1.20E-03	2.65E-04	2.65E-05	2.65E-05
1,2,3,7,8 - PeCDF	ND	5.07E-03	0.00E+00	1.52E-04	ND	0.00E+00	3.35E-06
2,3,4,7,8 - PeCDF	ND	4.82E-03	0.00E+00	1.45E-03	ND	0.00E+00	3.19E-05
1,2,3,4,7,8 - HxCDF	4.67E-03		4.67E-04	4.67E-04	1.03E-04	1.03E-05	1.03E-05
1,2,3,6,7,8 - HxCDF	4.22E-03		4.22E-04	4.22E-04	9.31E-05	9.31E-06	9.31E-06
1,2,3,7,8,9 - HxCDF	ND	4.36E-03	0.00E+00	4.36E-04	ND	0.00E+00	9.61E-06
2,3,4,6,7,8 - HxCDF	ND	4.84E-03	0.00E+00	4.84E-04	ND	0.00E+00	1.07E-05
1,2,3,4,6,7,8 - HpCDF	1.09E-02		1.09E-04	1.09E-04	2.40E-04	2.40E-06	2.40E-06
1,2,3,4,7,8,9 - HpCDF	ND	4.62E-03	0.00E+00	4.62E-05	ND	0.00E+00	1.02E-06
1,2,3,4,6,7,8,9 - OCDF	1.47E-02		4.40E-06	4.40E-06	3.24E-04	9.71E-08	9.71E-08
TeCDD Total	3.07E-02				6.77E-04		
PeCDD Total	1.14E-02				2.51E-04		
HxCDD Total	4.62E-02				1.02E-03		
HpCDD Total	1.87E-01				4.12E-03		
OCDD	3.96E-01				8.75E-03		
TeCDF Total	1.08E-01				2.39E-03		
PeCDF Total	1.63E-02				3.60E-04		
HxCDF Total	1.81E-02				3.99E-04		
HpCDF Total	2.65E-02				5.84E-04		
OCDF	1.63E-02				3.60E-04		
PCDD Total	6.72E-01				1.48E-02		
PCDF Total	1.86E-01				4.10E-03		
PCDD/PCDF Total	8.57E-01				1.89E-02		
PCDD TEQ Total			2.83E-03	1.10E-02		6.24E-05	2.43E-04
PCDF TEQ Total			2.20E-03	4.77E-03		4.86E-05	1.05E-04
PCDD/PCDF TEQ Total			5.03E-03	1.58E-02		1.11E-04	3.48E-04

Sample ID

PS-PCDD-NSB-SVOC-111914-02

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Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	ND	0.00E+00	3.95E-05	ND	0.00E+00	1.80E-02
1,2,3,7,8 - PeCDD	ND	0.00E+00	7.94E-05	ND	0.00E+00	3.62E-02
1,2,3,4,7,8 - HxCDD	ND	0.00E+00	6.58E-06	ND	0.00E+00	3.00E-03
1,2,3,6,7,8 - HxCDD	1.33E-04	1.33E-05	1.33E-05	6.06E-02	6.06E-03	6.06E-03
1,2,3,7,8,9 - HxCDD	9.88E-05	9.88E-06	9.88E-06	4.51E-02	4.51E-03	4.51E-03
1,2,3,4,6,7,8 - HpCDD	1.84E-03	1.84E-05	1.84E-05	8.37E-01	8.37E-03	8.37E-03
1,2,3,4,6,7,8,9 - OCDD	6.08E-03	1.82E-06	1.82E-06	2.77E+00	8.32E-04	8.32E-04
2,3,7,8 - TCDF	1.84E-04	1.84E-05	1.84E-05	8.39E-02	8.39E-03	8.39E-03
1,2,3,7,8 - PeCDF	ND	0.00E+00	2.33E-06	ND	0.00E+00	1.06E-03
2,3,4,7,8 - PeCDF	ND	0.00E+00	2.22E-05	ND	0.00E+00	1.01E-02
1,2,3,4,7,8 - HxCDF	7.15E-05	7.15E-06	7.15E-06	3.26E-02	3.26E-03	3.26E-03
1,2,3,6,7,8 - HxCDF	6.47E-05	6.47E-06	6.47E-06	2.95E-02	2.95E-03	2.95E-03
1,2,3,7,8,9 - HxCDF	ND	0.00E+00	6.68E-06	ND	0.00E+00	3.05E-03
2,3,4,6,7,8 - HxCDF	ND	0.00E+00	7.43E-06	ND	0.00E+00	3.39E-03
1,2,3,4,6,7,8 - HpCDF	1.67E-04	1.67E-06	1.67E-06	7.61E-02	7.61E-04	7.61E-04
1,2,3,4,7,8,9 - HpCDF	ND	0.00E+00	7.09E-07	ND	0.00E+00	3.23E-04
1,2,3,4,6,7,8,9 - OCDF	2.25E-04	6.75E-08	6.75E-08	1.03E-01	3.08E-05	3.08E-05
TeCDD Total	4.71E-04			2.15E-01		
PeCDD Total	1.75E-04			7.97E-02		
HxCDD Total	7.08E-04			3.23E-01		
HpCDD Total	2.86E-03			1.31E+00		
OCDD	6.08E-03			2.77E+00		
TeCDF Total	1.66E-03			7.58E-01		
PeCDF Total	2.50E-04			1.14E-01		
HxCDF Total	2.77E-04			1.26E-01		
HpCDF Total	4.06E-04			1.85E-01		
OCDF	2.50E-04			1.14E-01		
PCDD Total	1.03E-02			4.70E+00		
PCDF Total	2.85E-03			1.30E+00		
PCDD/PCDF Total	1.31E-02			5.99E+00		
PCDD TEQ Total		4.34E-05	1.69E-04		1.98E-02	7.70E-02
PCDF TEQ Total		3.38E-05	7.31E-05		1.54E-02	3.33E-02
PCDD/PCDF TEQ Total		7.71E-05	2.42E-04		3.52E-02	1.10E-01

Table A-6. PCDD/PCDF data for NSB/NSL 2.

Sample ID PS-PCDD-NSB2-SVOC-121114-01
 Sampling volume (m³) 95.0
 Carbon sampled (g) 75.2
 Carbon sampled (mg/m³) 791.8
 Carbon fraction 0.45605

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	2.44E-03		2.44E-03	2.44E-03	2.57E-05	2.57E-05	2.57E-05
1,2,3,7,8 - PeCDD	1.27E-02		1.27E-02	1.27E-02	1.33E-04	1.33E-04	1.33E-04
1,2,3,4,7,8 - HxCDD	6.22E-03		6.22E-04	6.22E-04	6.55E-05	6.55E-06	6.55E-06
1,2,3,6,7,8 - HxCDD	2.33E-02		2.33E-03	2.33E-03	2.46E-04	2.46E-05	2.46E-05
1,2,3,7,8,9 - HxCDD	1.71E-02		1.71E-03	1.71E-03	1.80E-04	1.80E-05	1.80E-05
1,2,3,4,6,7,8 - HpCDD	2.88E-01		2.88E-03	2.88E-03	3.04E-03	3.04E-05	3.04E-05
1,2,3,4,6,7,8,9 - OCDD	7.55E-01		2.26E-04	2.26E-04	7.94E-03	2.38E-06	2.38E-06
2,3,7,8 - TCDF	1.18E-02		1.18E-03	1.18E-03	1.24E-04	1.24E-05	1.24E-05
1,2,3,7,8 - PeCDF	4.00E-03		1.20E-04	1.20E-04	4.21E-05	1.26E-06	1.26E-06
2,3,4,7,8 - PeCDF	6.22E-03		1.87E-03	1.87E-03	6.55E-05	1.96E-05	1.96E-05
1,2,3,4,7,8 - HxCDF	4.44E-03		4.44E-04	4.44E-04	4.68E-05	4.68E-06	4.68E-06
1,2,3,6,7,8 - HxCDF	3.33E-03		3.33E-04	3.33E-04	3.51E-05	3.51E-06	3.51E-06
1,2,3,7,8,9 - HxCDF	1.33E-03		1.33E-04	1.33E-04	1.40E-05	1.40E-06	1.40E-06
2,3,4,6,7,8 - HxCDF	4.44E-03		4.44E-04	4.44E-04	4.68E-05	4.68E-06	4.68E-06
1,2,3,4,6,7,8 - HpCDF	1.27E-02		1.27E-04	1.27E-04	1.33E-04	1.33E-06	1.33E-06
1,2,3,4,7,8,9 - HpCDF	2.67E-03		2.67E-05	2.67E-05	2.81E-05	2.81E-07	2.81E-07
1,2,3,4,6,7,8,9 - OCDF	1.53E-02		4.60E-06	4.60E-06	1.61E-04	4.84E-08	4.84E-08
TeCDD Total	8.09E-02				8.51E-04		
PeCDD Total	7.56E-02				7.96E-04		
HxCDD Total	1.73E-01				1.82E-03		
HpCDD Total	4.65E-01				4.90E-03		
OCDD	7.55E-01				7.94E-03		
TeCDF Total	1.58E-01				1.67E-03		
PeCDF Total	5.80E-02				6.10E-04		
HxCDF Total	3.45E-02				3.63E-04		
HpCDF Total	3.34E-02				3.51E-04		
OCDF	1.52E-02				1.60E-04		
PCDD Total	1.55E+00				1.63E-02		
PCDF Total	2.99E-01				3.15E-03		
PCDD/PCDF Total	1.85E+00				1.95E-02		
PCDD TEQ Total			2.29E-02	2.29E-02		2.41E-04	2.41E-04
PCDF TEQ Total			4.68E-03	4.68E-03		4.92E-05	4.92E-05
PCDD/PCDF TEQ Total			2.76E-02	2.76E-02		2.90E-04	2.90E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fiberboard		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	3.25E-05	3.25E-05	3.25E-05	1.48E-02	1.48E-02	1.48E-02
1,2,3,7,8 - PeCDD	1.68E-04	1.68E-04	1.68E-04	7.68E-02	7.68E-02	7.68E-02
1,2,3,4,7,8 - HxCDD	8.27E-05	8.27E-06	8.27E-06	3.77E-02	3.77E-03	3.77E-03
1,2,3,6,7,8 - HxCDD	3.10E-04	3.10E-05	3.10E-05	1.41E-01	1.41E-02	1.41E-02
1,2,3,7,8,9 - HxCDD	2.27E-04	2.27E-05	2.27E-05	1.04E-01	1.04E-02	1.04E-02
1,2,3,4,6,7,8 - HpCDD	3.83E-03	3.83E-05	3.83E-05	1.75E+00	1.75E-02	1.75E-02
1,2,3,4,6,7,8,9 - OCDD	1.00E-02	3.01E-06	3.01E-06	4.57E+00	1.37E-03	1.37E-03
2,3,7,8 - TCDF	1.57E-04	1.57E-05	1.57E-05	7.14E-02	7.14E-03	7.14E-03
1,2,3,7,8 - PeCDF	5.32E-05	1.59E-06	1.59E-06	2.42E-02	7.27E-04	7.27E-04
2,3,4,7,8 - PeCDF	8.27E-05	2.48E-05	2.48E-05	3.77E-02	1.13E-02	1.13E-02
1,2,3,4,7,8 - HxCDF	5.91E-05	5.91E-06	5.91E-06	2.69E-02	2.69E-03	2.69E-03
1,2,3,6,7,8 - HxCDF	4.43E-05	4.43E-06	4.43E-06	2.02E-02	2.02E-03	2.02E-03
1,2,3,7,8,9 - HxCDF	1.77E-05	1.77E-06	1.77E-06	8.08E-03	8.08E-04	8.08E-04
2,3,4,6,7,8 - HxCDF	5.91E-05	5.91E-06	5.91E-06	2.69E-02	2.69E-03	2.69E-03
1,2,3,4,6,7,8 - HpCDF	1.68E-04	1.68E-06	1.68E-06	7.68E-02	7.68E-04	7.68E-04
1,2,3,4,7,8,9 - HpCDF	3.54E-05	3.54E-07	3.54E-07	1.62E-02	1.62E-04	1.62E-04
1,2,3,4,6,7,8,9 - OCDF	2.04E-04	6.11E-08	6.11E-08	9.29E-02	2.79E-05	2.79E-05
TeCDD Total	1.07E-03			4.90E-01		
PeCDD Total	1.01E-03			4.58E-01		
HxCDD Total	2.30E-03			1.05E+00		
HpCDD Total	6.18E-03			2.82E+00		
OCDD	1.00E-02			4.57E+00		
TeCDF Total	2.11E-03			9.60E-01		
PeCDF Total	7.70E-04			3.51E-01		
HxCDF Total	4.59E-04			2.09E-01		
HpCDF Total	4.43E-04			2.02E-01		
OCDF	2.02E-04			9.23E-02		
PCDD Total	2.06E-02			9.39E+00		
PCDF Total	3.98E-03			1.82E+00		
PCDD/PCDF Total	2.46E-02			1.12E+01		
PCDD TEQ Total		3.04E-04	3.04E-04		1.39E-01	1.39E-01
PCDF TEQ Total		6.22E-05	6.22E-05		2.84E-02	2.84E-02
PCDD/PCDF TEQ Total		3.66E-04	3.66E-04		1.67E-01	1.67E-01

Table A-7. PCDD/PCDF data for NSB/NSL 3.

PCDD/PCDF

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Sample ID PS-PCDD-NSB3-SVOC-121714-01
 Sampling volume (m³) 58.8
 Carbon sampled (g) 57.7
 Carbon sampled (mg/m³) 980.8
 Carbon fraction 0.4561

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample	ND = 0	ng/m ³	ng/m ³	ng/m ³
2,3,7,8 - TCDD	1.56E-03		1.56E-03	1.56E-03	2.65E-05	2.65E-05	2.65E-05
1,2,3,7,8 - PeCDD	3.78E-03		3.78E-03	3.78E-03	6.43E-05	6.43E-05	6.43E-05
1,2,3,4,7,8 - HxCDD	2.44E-03		2.44E-04	2.44E-04	4.16E-05	4.16E-06	4.16E-06
1,2,3,6,7,8 - HxCDD	9.33E-03		9.33E-04	9.33E-04	1.59E-04	1.59E-05	1.59E-05
1,2,3,7,8,9 - HxCDD	6.67E-03		6.67E-04	6.67E-04	1.13E-04	1.13E-05	1.13E-05
1,2,3,4,6,7,8 - HpCDD	1.32E-01		1.32E-03	1.32E-03	2.25E-03	2.25E-05	2.25E-05
1,2,3,4,6,7,8,9 - OCDD	3.58E-01		1.07E-04	1.07E-04	6.09E-03	1.83E-06	1.83E-06
2,3,7,8 - TCDF	7.11E-03		7.11E-04	7.11E-04	1.21E-04	1.21E-05	1.21E-05
1,2,3,7,8 - PeCDF	2.89E-03		8.67E-05	8.67E-05	4.91E-05	1.47E-06	1.47E-06
2,3,4,7,8 - PeCDF	3.56E-03		1.07E-03	1.07E-03	6.05E-05	1.81E-05	1.81E-05
1,2,3,4,7,8 - HxCDF	2.44E-03		2.44E-04	2.44E-04	4.16E-05	4.16E-06	4.16E-06
1,2,3,6,7,8 - HxCDF	1.78E-03		1.78E-04	1.78E-04	3.02E-05	3.02E-06	3.02E-06
1,2,3,7,8,9 - HxCDF	8.89E-04		8.89E-05	8.89E-05	1.51E-05	1.51E-06	1.51E-06
2,3,4,6,7,8 - HxCDF	2.22E-03		2.22E-04	2.22E-04	3.78E-05	3.78E-06	3.78E-06
1,2,3,4,6,7,8 - HpCDF	6.67E-03		6.67E-05	6.67E-05	1.13E-04	1.13E-06	1.13E-06
1,2,3,4,7,8,9 - HpCDF	1.78E-03		1.78E-05	1.78E-05	3.02E-05	3.02E-07	3.02E-07
1,2,3,4,6,7,8,9 - OCDF	8.00E-03		2.40E-06	2.40E-06	1.36E-04	4.08E-08	4.08E-08
TeCDD Total	4.51E-02				7.67E-04		
PeCDD Total	3.84E-02				6.53E-04		
HxCDD Total	7.48E-02				1.27E-03		
HpCDD Total	2.11E-01				3.59E-03		
OCDD	3.58E-01				6.09E-03		
TeCDF Total	1.14E-01				1.94E-03		
PeCDF Total	4.00E-02				6.80E-04		
HxCDF Total	2.21E-02				3.76E-04		
HpCDF Total	1.68E-02				2.87E-04		
OCDF	8.02E-03				1.36E-04		
PCDD Total	7.27E-01				1.24E-02		
PCDF Total	2.01E-01				3.41E-03		
PCDD/PCDF Total	9.28E-01				1.58E-02		
PCDD TEQ Total			8.61E-03	8.61E-03		1.46E-04	1.46E-04
PCDF TEQ Total			2.68E-03	2.68E-03		4.57E-05	4.57E-05
PCDD/PCDF TEQ Total			1.13E-02	1.13E-02		1.92E-04	1.92E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	2.70E-05	2.70E-05	2.70E-05	1.23E-02	1.23E-02	1.23E-02
1,2,3,7,8 - PeCDD	6.55E-05	6.55E-05	6.55E-05	2.99E-02	2.99E-02	2.99E-02
1,2,3,4,7,8 - HxCDD	4.24E-05	4.24E-06	4.24E-06	1.93E-02	1.93E-03	1.93E-03
1,2,3,6,7,8 - HxCDD	1.62E-04	1.62E-05	1.62E-05	7.38E-02	7.38E-03	7.38E-03
1,2,3,7,8,9 - HxCDD	1.16E-04	1.16E-05	1.16E-05	5.27E-02	5.27E-03	5.27E-03
1,2,3,4,6,7,8 - HpCDD	2.29E-03	2.29E-05	2.29E-05	1.04E+00	1.04E-02	1.04E-02
1,2,3,4,6,7,8,9 - OCDD	6.21E-03	1.86E-06	1.86E-06	2.83E+00	8.50E-04	8.50E-04
2,3,7,8 - TCDF	1.23E-04	1.23E-05	1.23E-05	5.62E-02	5.62E-03	5.62E-03
1,2,3,7,8 - PeCDF	5.01E-05	1.50E-06	1.50E-06	2.29E-02	6.86E-04	6.86E-04
2,3,4,7,8 - PeCDF	6.17E-05	1.85E-05	1.85E-05	2.81E-02	8.44E-03	8.44E-03
1,2,3,4,7,8 - HxCDF	4.24E-05	4.24E-06	4.24E-06	1.93E-02	1.93E-03	1.93E-03
1,2,3,6,7,8 - HxCDF	3.08E-05	3.08E-06	3.08E-06	1.41E-02	1.41E-03	1.41E-03
1,2,3,7,8,9 - HxCDF	1.54E-05	1.54E-06	1.54E-06	7.03E-03	7.03E-04	7.03E-04
2,3,4,6,7,8 - HxCDF	3.85E-05	3.85E-06	3.85E-06	1.76E-02	1.76E-03	1.76E-03
1,2,3,4,6,7,8 - HpCDF	1.16E-04	1.16E-06	1.16E-06	5.27E-02	5.27E-04	5.27E-04
1,2,3,4,7,8,9 - HpCDF	3.08E-05	3.08E-07	3.08E-07	1.41E-02	1.41E-04	1.41E-04
1,2,3,4,6,7,8,9 - OCDF	1.39E-04	4.16E-08	4.16E-08	6.33E-02	1.90E-05	1.90E-05
TeCDD Total	7.82E-04			3.56E-01		
PeCDD Total	6.66E-04			3.04E-01		
HxCDD Total	1.30E-03			5.91E-01		
HpCDD Total	3.66E-03			1.67E+00		
OCDD	6.21E-03			2.83E+00		
TeCDF Total	1.97E-03			9.00E-01		
PeCDF Total	6.93E-04			3.16E-01		
HxCDF Total	3.83E-04			1.75E-01		
HpCDF Total	2.92E-04			1.33E-01		
OCDF	1.39E-04			6.35E-02		
PCDD Total	1.26E-02			5.75E+00		
PCDF Total	3.48E-03			1.59E+00		
PCDD/PCDF Total	1.61E-02			7.34E+00		
PCDD TEQ Total		1.49E-04	1.49E-04		6.81E-02	6.81E-02
PCDF TEQ Total		4.66E-05	4.66E-05		2.12E-02	2.12E-02
PCDD/PCDF TEQ Total		1.96E-04	1.96E-04		8.93E-02	8.93E-02

Table A-8. PCDD/PCDF data for NSB/NSL 4.

Sample ID PS-PCDD-NSB4-SVOC-121714-02
 Sampling volume (m³) 63.7
 Carbon sampled (g) 77.2
 Carbon sampled (mg/m³) 1212.2
 Carbon fraction 0.4561

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m ³	TEQ ng/m ³ ND = 0	TEQ ng/m ³ ND = LOD
2,3,7,8 - TCDD	1.78E-03		1.78E-03	1.78E-03	2.79E-05	2.79E-05	2.79E-05
1,2,3,7,8 - PeCDD	8.22E-03		8.22E-03	8.22E-03	1.29E-04	1.29E-04	1.29E-04
1,2,3,4,7,8 - HxCDD	4.44E-03		4.44E-04	4.44E-04	6.98E-05	6.98E-06	6.98E-06
1,2,3,6,7,8 - HxCDD	1.58E-02		1.58E-03	1.58E-03	2.48E-04	2.48E-05	2.48E-05
1,2,3,7,8,9 - HxCDD	1.16E-02		1.16E-03	1.16E-03	1.81E-04	1.81E-05	1.81E-05
1,2,3,4,6,7,8 - HpCDD	1.95E-01		1.95E-03	1.95E-03	3.07E-03	3.07E-05	3.07E-05
1,2,3,4,6,7,8,9 - OCDD	5.51E-01		1.65E-04	1.65E-04	8.65E-03	2.59E-06	2.59E-06
2,3,7,8 - TCDF	1.22E-02		1.22E-03	1.22E-03	1.92E-04	1.92E-05	1.92E-05
1,2,3,7,8 - PeCDF	4.89E-03		1.47E-04	1.47E-04	7.67E-05	2.30E-06	2.30E-06
2,3,4,7,8 - PeCDF	5.56E-03		1.67E-03	1.67E-03	8.72E-05	2.62E-05	2.62E-05
1,2,3,4,7,8 - HxCDF	4.44E-03		4.44E-04	4.44E-04	6.98E-05	6.98E-06	6.98E-06
1,2,3,6,7,8 - HxCDF	3.11E-03		3.11E-04	3.11E-04	4.88E-05	4.88E-06	4.88E-06
1,2,3,7,8,9 - HxCDF	1.11E-03		1.11E-04	1.11E-04	1.74E-05	1.74E-06	1.74E-06
2,3,4,6,7,8 - HxCDF	3.56E-03		3.56E-04	3.56E-04	5.58E-05	5.58E-06	5.58E-06
1,2,3,4,6,7,8 - HpCDF	1.04E-02		1.04E-04	1.04E-04	1.64E-04	1.64E-06	1.64E-06
1,2,3,4,7,8,9 - HpCDF	1.56E-03		1.56E-05	1.56E-05	2.44E-05	2.44E-07	2.44E-07
1,2,3,4,6,7,8,9 - OCDF	1.22E-02		3.67E-06	3.67E-06	1.92E-04	5.75E-08	5.75E-08
TeCDD Total	8.37E-02				1.31E-03		
PeCDD Total	6.83E-02				1.07E-03		
HxCDD Total	1.23E-01				1.93E-03		
HpCDD Total	3.22E-01				5.05E-03		
OCDD	5.51E-01				8.65E-03		
TeCDF Total	1.88E-01				2.95E-03		
PeCDF Total	7.37E-02				1.16E-03		
HxCDF Total	3.96E-02				6.21E-04		
HpCDF Total	2.58E-02				4.05E-04		
OCDF	1.23E-02				1.93E-04		
PCDD Total	1.15E+00				1.80E-02		
PCDF Total	3.39E-01				5.33E-03		
PCDD/PCDF Total	1.49E+00				2.33E-02		
PCDD TEQ Total			1.53E-02	1.53E-02		2.40E-04	2.40E-04
PCDF TEQ Total			4.38E-03	4.38E-03		6.88E-05	6.88E-05
PCDD/PCDF TEQ Total			1.97E-02	1.97E-02		3.09E-04	3.09E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	2.30E-05	2.30E-05	2.30E-05	1.05E-02	1.05E-02	1.05E-02
1,2,3,7,8 - PeCDD	1.06E-04	1.06E-04	1.06E-04	4.85E-02	4.85E-02	4.85E-02
1,2,3,4,7,8 - HxCDD	5.75E-05	5.75E-06	5.75E-06	2.62E-02	2.62E-03	2.62E-03
1,2,3,6,7,8 - HxCDD	2.04E-04	2.04E-05	2.04E-05	9.32E-02	9.32E-03	9.32E-03
1,2,3,7,8,9 - HxCDD	1.50E-04	1.50E-05	1.50E-05	6.82E-02	6.82E-03	6.82E-03
1,2,3,4,6,7,8 - HpCDD	2.53E-03	2.53E-05	2.53E-05	1.15E+00	1.15E-02	1.15E-02
1,2,3,4,6,7,8,9 - OCDD	7.14E-03	2.14E-06	2.14E-06	3.25E+00	9.76E-04	9.76E-04
2,3,7,8 - TCDF	1.58E-04	1.58E-05	1.58E-05	7.22E-02	7.22E-03	7.22E-03
1,2,3,7,8 - PeCDF	6.33E-05	1.90E-06	1.90E-06	2.89E-02	8.66E-04	8.66E-04
2,3,4,7,8 - PeCDF	7.19E-05	2.16E-05	2.16E-05	3.28E-02	9.84E-03	9.84E-03
1,2,3,4,7,8 - HxCDF	5.75E-05	5.75E-06	5.75E-06	2.62E-02	2.62E-03	2.62E-03
1,2,3,6,7,8 - HxCDF	4.03E-05	4.03E-06	4.03E-06	1.84E-02	1.84E-03	1.84E-03
1,2,3,7,8,9 - HxCDF	1.44E-05	1.44E-06	1.44E-06	6.56E-03	6.56E-04	6.56E-04
2,3,4,6,7,8 - HxCDF	4.60E-05	4.60E-06	4.60E-06	2.10E-02	2.10E-03	2.10E-03
1,2,3,4,6,7,8 - HpCDF	1.35E-04	1.35E-06	1.35E-06	6.17E-02	6.17E-04	6.17E-04
1,2,3,4,7,8,9 - HpCDF	2.01E-05	2.01E-07	2.01E-07	9.18E-03	9.18E-05	9.18E-05
1,2,3,4,6,7,8,9 - OCDF	1.58E-04	4.75E-08	4.75E-08	7.22E-02	2.17E-05	2.17E-05
TeCDD Total	1.08E-03			4.94E-01		
PeCDD Total	8.84E-04			4.03E-01		
HxCDD Total	1.59E-03			7.25E-01		
HpCDD Total	4.16E-03			1.90E+00		
OCDD	7.13E-03			3.25E+00		
TeCDF Total	2.43E-03			1.11E+00		
PeCDF Total	9.55E-04			4.35E-01		
HxCDF Total	5.12E-04			2.34E-01		
HpCDF Total	3.34E-04			1.52E-01		
OCDF	1.59E-04			7.24E-02		
PCDD Total	1.49E-02			6.77E+00		
PCDF Total	4.39E-03			2.00E+00		
PCDD/PCDF Total	1.92E-02			8.78E+00		
PCDD TEQ Total		1.98E-04	1.98E-04		9.03E-02	9.03E-02
PCDF TEQ Total		5.67E-05	5.67E-05		2.59E-02	2.59E-02
PCDD/PCDF TEQ Total		2.55E-04	2.55E-04		1.16E-01	1.16E-01

Table A-9. PCDD/PCDF data for NWS 1.

Sample ID PS-PCDD-NWS-SVOC-111714-01
 Sampling volume (m³) 85.4
 Carbon sampled (g) 46.8
 Carbon sampled (mg/m³) 547.9
 Carbon fraction 0.4656

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	ND	9.78E-04	0.00E+00	9.78E-04	ND	0.00E+00	1.15E-05
1,2,3,7,8 - PeCDD	2.00E-03		2.00E-03	2.00E-03	2.34E-05	2.34E-05	2.34E-05
1,2,3,4,7,8 - HxCDD	1.33E-03		1.33E-04	1.33E-04	1.56E-05	1.56E-06	1.56E-06
1,2,3,6,7,8 - HxCDD	2.67E-03		2.67E-04	2.67E-04	3.12E-05	3.12E-06	3.12E-06
1,2,3,7,8,9 - HxCDD	2.00E-03		2.00E-04	2.00E-04	2.34E-05	2.34E-06	2.34E-06
1,2,3,4,6,7,8 - HpCDD	2.11E-02		2.11E-04	2.11E-04	2.47E-04	2.47E-06	2.47E-06
1,2,3,4,6,7,8,9 - OCDD	5.47E-02		1.64E-05	1.64E-05	6.40E-04	1.92E-07	1.92E-07
2,3,7,8 - TCDF	1.29E-02		1.29E-03	1.29E-03	1.51E-04	1.51E-05	1.51E-05
1,2,3,7,8 - PeCDF	4.67E-03		1.40E-04	1.40E-04	5.47E-05	1.64E-06	1.64E-06
2,3,4,7,8 - PeCDF	6.00E-03		1.80E-03	1.80E-03	7.03E-05	2.11E-05	2.11E-05
1,2,3,4,7,8 - HxCDF	6.00E-03		6.00E-04	6.00E-04	7.03E-05	7.03E-06	7.03E-06
1,2,3,6,7,8 - HxCDF	5.11E-03		5.11E-04	5.11E-04	5.99E-05	5.99E-06	5.99E-06
1,2,3,7,8,9 - HxCDF	3.33E-03		3.33E-04	3.33E-04	3.91E-05	3.91E-06	3.91E-06
2,3,4,6,7,8 - HxCDF	7.11E-03		7.11E-04	7.11E-04	8.33E-05	8.33E-06	8.33E-06
1,2,3,4,6,7,8 - HpCDF	1.60E-02		1.60E-04	1.60E-04	1.87E-04	1.87E-06	1.87E-06
1,2,3,4,7,8,9 - HpCDF	2.67E-03		2.67E-05	2.67E-05	3.12E-05	3.12E-07	3.12E-07
1,2,3,4,6,7,8,9 - OCDF	9.11E-03		2.73E-06	2.73E-06	1.07E-04	3.20E-08	3.20E-08
TeCDD Total	5.67E-02				6.64E-04		
PeCDD Total	2.49E-02				2.92E-04		
HxCDD Total	1.89E-02				2.21E-04		
HxCDF Total	3.74E-02				4.38E-04		
OCDD	5.48E-02				6.42E-04		
TeCDF Total	1.65E-01				1.93E-03		
PeCDF Total	5.84E-02				6.84E-04		
HxCDF Total	5.28E-02				6.19E-04		
HpCDF Total	3.14E-02				3.67E-04		
OCDF	9.18E-03				1.08E-04		
PCDD Total	1.93E-01				2.26E-03		
PCDF Total	3.17E-01				3.71E-03		
PCDD/PCDF Total	5.09E-01				5.97E-03		
PCDD TEQ Total			2.83E-03	3.81E-03		3.31E-05	4.46E-05
PCDF TEQ Total			5.57E-03	5.57E-03		6.53E-05	6.53E-05
PCDD/PCDF TEQ Total			8.40E-03	9.38E-03		9.84E-05	1.10E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fiberboard		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	ND	0.00E+00	2.09E-05	ND	0.00E+00	9.74E-03
1,2,3,7,8 - PeCDD	4.28E-05	4.28E-05	4.28E-05	1.99E-02	1.99E-02	1.99E-02
1,2,3,4,7,8 - HxCDD	2.85E-05	2.85E-06	2.85E-06	1.33E-02	1.33E-03	1.33E-03
1,2,3,6,7,8 - HxCDD	5.70E-05	5.70E-06	5.70E-06	2.66E-02	2.66E-03	2.66E-03
1,2,3,7,8,9 - HxCDD	4.28E-05	4.28E-06	4.28E-06	1.99E-02	1.99E-03	1.99E-03
1,2,3,4,6,7,8 - HpCDD	4.51E-04	4.51E-06	4.51E-06	2.10E-01	2.10E-03	2.10E-03
1,2,3,4,6,7,8,9 - OCDD	1.17E-03	3.51E-07	3.51E-07	5.44E-01	1.63E-04	1.63E-04
2,3,7,8 - TCDF	2.76E-04	2.76E-05	2.76E-05	1.28E-01	1.28E-02	1.28E-02
1,2,3,7,8 - PeCDF	9.98E-05	2.99E-06	2.99E-06	4.65E-02	1.39E-03	1.39E-03
2,3,4,7,8 - PeCDF	1.28E-04	3.85E-05	3.85E-05	5.97E-02	1.79E-02	1.79E-02
1,2,3,4,7,8 - HxCDF	1.28E-04	1.28E-05	1.28E-05	5.97E-02	5.97E-03	5.97E-03
1,2,3,6,7,8 - HxCDF	1.09E-04	1.09E-05	1.09E-05	5.09E-02	5.09E-03	5.09E-03
1,2,3,7,8,9 - HxCDF	7.13E-05	7.13E-06	7.13E-06	3.32E-02	3.32E-03	3.32E-03
2,3,4,6,7,8 - HxCDF	1.52E-04	1.52E-05	1.52E-05	7.08E-02	7.08E-03	7.08E-03
1,2,3,4,6,7,8 - HpCDF	3.42E-04	3.42E-06	3.42E-06	1.59E-01	1.59E-03	1.59E-03
1,2,3,4,7,8,9 - HpCDF	5.70E-05	5.70E-07	5.70E-07	2.66E-02	2.66E-04	2.66E-04
1,2,3,4,6,7,8,9 - OCDF	1.95E-04	5.84E-08	5.84E-08	9.07E-02	2.72E-05	2.72E-05
TeCDD Total	1.21E-03			5.64E-01		
PeCDD Total	5.33E-04			2.48E-01		
HxCDD Total	4.04E-04			1.88E-01		
HpCDD Total	7.99E-04			3.72E-01		
OCDD	1.17E-03			5.45E-01		
TeCDF Total	3.52E-03			1.64E+00		
PeCDF Total	1.25E-03			5.82E-01		
HxCDF Total	1.13E-03			5.26E-01		
HpCDF Total	6.70E-04			3.12E-01		
OCDF	1.96E-04			9.14E-02		
PCDD Total	4.12E-03			1.92E+00		
PCDF Total	6.77E-03			3.15E+00		
PCDD/PCDF Total	1.09E-02			5.07E+00		
PCDD TEQ Total		6.05E-05	8.14E-05		2.82E-02	3.79E-02
PCDF TEQ Total		1.19E-04	1.19E-04		5.55E-02	5.55E-02
PCDD/PCDF TEQ Total		1.80E-04	2.01E-04		8.36E-02	9.34E-02

810 Table A-10. PCDD/PCDF data for NWS 2.

PCDD/PCDF

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Sample ID PS-PCDD-NWS2-SVOC-11182104-01
 Sampling volume (m³) 55.6
 Carbon sampled (g) 37.0
 Carbon sampled (mg/m³) 665.6
 Carbon fraction 0.4656

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample	ND = 0	ng/m ³	ng/m ³	ng/m ³
2,3,7,8 - TCDD	6.00E-04		6.00E-04	6.00E-04	1.08E-05	1.08E-05	1.08E-05
1,2,3,7,8 - PeCDD	2.00E-03		2.00E-03	2.00E-03	3.60E-05	3.60E-05	3.60E-05
1,2,3,4,7,8 - HxCDD	1.20E-03		1.20E-04	1.20E-04	2.16E-05	2.16E-06	2.16E-06
1,2,3,6,7,8 - HxCDD	1.40E-03		1.40E-04	1.40E-04	2.52E-05	2.52E-06	2.52E-06
1,2,3,7,8,9 - HxCDD	1.40E-03		1.40E-04	1.40E-04	2.52E-05	2.52E-06	2.52E-06
1,2,3,4,6,7,8 - HpCDD	1.44E-02		1.44E-04	1.44E-04	2.59E-04	2.59E-06	2.59E-06
1,2,3,4,6,7,8,9 - OCDD	4.00E-02		1.20E-05	1.20E-05	7.19E-04	2.16E-07	2.16E-07
2,3,7,8 - TCDF	1.04E-02		1.04E-03	1.04E-03	1.87E-04	1.87E-05	1.87E-05
1,2,3,7,8 - PeCDF	8.00E-03		2.40E-04	2.40E-04	1.44E-04	4.32E-06	4.32E-06
2,3,4,7,8 - PeCDF	1.02E-02		3.06E-03	3.06E-03	1.83E-04	5.50E-05	5.50E-05
1,2,3,4,7,8 - HxCDF	8.20E-03		8.20E-04	8.20E-04	1.47E-04	1.47E-05	1.47E-05
1,2,3,6,7,8 - HxCDF	8.00E-03		8.00E-04	8.00E-04	1.44E-04	1.44E-05	1.44E-05
1,2,3,7,8,9 - HxCDF	2.60E-03		2.60E-04	2.60E-04	4.68E-05	4.68E-06	4.68E-06
2,3,4,6,7,8 - HxCDF	7.00E-03		7.00E-04	7.00E-04	1.26E-04	1.26E-05	1.26E-05
1,2,3,4,6,7,8 - HpCDF	1.46E-02		1.46E-04	1.46E-04	2.63E-04	2.63E-06	2.63E-06
1,2,3,4,7,8,9 - HpCDF	3.60E-03		3.60E-05	3.60E-05	6.47E-05	6.47E-07	6.47E-07
1,2,3,4,6,7,8,9 - OCDF	1.00E-02		3.00E-06	3.00E-06	1.80E-04	5.39E-08	5.39E-08
TeCDD Total	2.97E-02				5.33E-04		
PeCDD Total	1.36E-02				2.45E-04		
HxCDD Total	1.62E-02				2.92E-04		
HxCDF Total	2.55E-02				4.58E-04		
OCDD	4.00E-02				7.19E-04		
TeCDF Total	2.44E-01				4.38E-03		
PeCDF Total	1.14E-01				2.05E-03		
HxCDF Total	6.70E-02				1.21E-03		
HpCDF Total	3.07E-02				5.51E-04		
OCDF	9.92E-03				1.78E-04		
PCDD Total	1.25E-01				2.25E-03		
PCDF Total	4.65E-01				8.36E-03		
PCDD/PCDF Total	5.90E-01				1.06E-02		
PCDD TEQ Total			3.16E-03	3.16E-03		5.68E-05	5.68E-05
PCDF TEQ Total			7.11E-03	7.11E-03		1.28E-04	1.28E-04
PCDD/PCDF TEQ Total			1.03E-02	1.03E-02		1.85E-04	1.85E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fiberboard		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	1.62E-05	1.62E-05	1.62E-05	7.55E-03	7.55E-03	7.55E-03
1,2,3,7,8 - PeCDD	5.40E-05	5.40E-05	5.40E-05	2.52E-02	2.52E-02	2.52E-02
1,2,3,4,7,8 - HxCDD	3.24E-05	3.24E-06	3.24E-06	1.51E-02	1.51E-03	1.51E-03
1,2,3,6,7,8 - HxCDD	3.78E-05	3.78E-06	3.78E-06	1.76E-02	1.76E-03	1.76E-03
1,2,3,7,8,9 - HxCDD	3.78E-05	3.78E-06	3.78E-06	1.76E-02	1.76E-03	1.76E-03
1,2,3,4,6,7,8 - HpCDD	3.89E-04	3.89E-06	3.89E-06	1.81E-01	1.81E-03	1.81E-03
1,2,3,4,6,7,8,9 - OCDD	1.08E-03	3.24E-07	3.24E-07	5.03E-01	1.51E-04	1.51E-04
2,3,7,8 - TCDF	2.81E-04	2.81E-05	2.81E-05	1.31E-01	1.31E-02	1.31E-02
1,2,3,7,8 - PeCDF	2.16E-04	6.48E-06	6.48E-06	1.01E-01	3.02E-03	3.02E-03
2,3,4,7,8 - PeCDF	2.76E-04	8.27E-05	8.27E-05	1.28E-01	3.85E-02	3.85E-02
1,2,3,4,7,8 - HxCDF	2.22E-04	2.22E-05	2.22E-05	1.03E-01	1.03E-02	1.03E-02
1,2,3,6,7,8 - HxCDF	2.16E-04	2.16E-05	2.16E-05	1.01E-01	1.01E-02	1.01E-02
1,2,3,7,8,9 - HxCDF	7.02E-05	7.02E-06	7.02E-06	3.27E-02	3.27E-03	3.27E-03
2,3,4,6,7,8 - HxCDF	1.89E-04	1.89E-05	1.89E-05	8.81E-02	8.81E-03	8.81E-03
1,2,3,4,6,7,8 - HpCDF	3.94E-04	3.94E-06	3.94E-06	1.84E-01	1.84E-03	1.84E-03
1,2,3,4,7,8,9 - HpCDF	9.73E-05	9.73E-07	9.73E-07	4.53E-02	4.53E-04	4.53E-04
1,2,3,4,6,7,8,9 - OCDF	2.70E-04	8.10E-08	8.10E-08	1.26E-01	3.77E-05	3.77E-05
TeCDD Total	8.01E-04			3.73E-01		
PeCDD Total	3.68E-04			1.71E-01		
HxCDD Total	4.39E-04			2.04E-01		
HpCDD Total	6.88E-04			3.21E-01		
OCDD	1.08E-03			5.03E-01		
TeCDF Total	6.58E-03			3.06E+00		
PeCDF Total	3.08E-03			1.43E+00		
HxCDF Total	1.81E-03			8.43E-01		
HpCDF Total	8.28E-04			3.86E-01		
OCDF	2.68E-04			1.25E-01		
PCDD Total	3.38E-03			1.57E+00		
PCDF Total	1.26E-02			5.85E+00		
PCDD/PCDF Total	1.59E-02			7.42E+00		
PCDD TEQ Total		8.53E-05	8.53E-05		3.97E-02	3.97E-02
PCDF TEQ Total		1.92E-04	1.92E-04		8.94E-02	8.94E-02
PCDD/PCDF TEQ Total		2.77E-04	2.77E-04		1.29E-01	1.29E-01

Table A-11. PCDD/PCDF data for NWS 3.

Sample ID PS-PCDD-NWS3-SVOC-120814-01
 Sampling volume (m³) 95.7
 Carbon sampled (g) 68.1
 Carbon sampled (mg/m³) 711.2
 Carbon fraction 0.4656

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	6.67E-04		6.67E-04	6.67E-04	6.96E-06	6.96E-06	6.96E-06
1,2,3,7,8 - PeCDD	1.33E-03		1.33E-03	1.33E-03	1.39E-05	1.39E-05	1.39E-05
1,2,3,4,7,8 - HxCDD	1.11E-03		1.11E-04	1.11E-04	1.16E-05	1.16E-06	1.16E-06
1,2,3,6,7,8 - HxCDD	2.44E-03		2.44E-04	2.44E-04	2.55E-05	2.55E-06	2.55E-06
1,2,3,7,8,9 - HxCDD	1.78E-03		1.78E-04	1.78E-04	1.86E-05	1.86E-06	1.86E-06
1,2,3,4,6,7,8 - HpCDD	2.29E-02		2.29E-04	2.29E-04	2.39E-04	2.39E-06	2.39E-06
1,2,3,4,6,7,8,9 - OCDD	5.64E-02		1.69E-05	1.69E-05	5.90E-04	1.77E-07	1.77E-07
2,3,7,8 - TCDF	7.56E-03		7.56E-04	7.56E-04	7.89E-05	7.89E-06	7.89E-06
1,2,3,7,8 - PeCDF	2.67E-03		8.00E-05	8.00E-05	2.79E-05	8.36E-07	8.36E-07
2,3,4,7,8 - PeCDF	6.00E-03		1.80E-03	1.80E-03	6.27E-05	1.88E-05	1.88E-05
1,2,3,4,7,8 - HxCDF	4.44E-03		4.44E-04	4.44E-04	4.64E-05	4.64E-06	4.64E-06
1,2,3,6,7,8 - HxCDF	3.78E-03		3.78E-04	3.78E-04	3.95E-05	3.95E-06	3.95E-06
1,2,3,7,8,9 - HxCDF	2.22E-03		2.22E-04	2.22E-04	2.32E-05	2.32E-06	2.32E-06
2,3,4,6,7,8 - HxCDF	5.33E-03		5.33E-04	5.33E-04	5.57E-05	5.57E-06	5.57E-06
1,2,3,4,6,7,8 - HpCDF	1.16E-02		1.16E-04	1.16E-04	1.21E-04	1.21E-06	1.21E-06
1,2,3,4,7,8,9 - HpCDF	2.00E-03		2.00E-05	2.00E-05	2.09E-05	2.09E-07	2.09E-07
1,2,3,4,6,7,8,9 - OCDF	7.78E-03		2.33E-06	2.33E-06	8.13E-05	2.44E-08	2.44E-08
TeCDD Total	4.03E-02				4.21E-04		
PeCDD Total	2.98E-02				3.11E-04		
HxCDD Total	2.73E-02				2.85E-04		
HxCDF Total	3.99E-02				4.17E-04		
OCDD	5.64E-02				5.89E-04		
TeCDF Total	1.08E-01				1.12E-03		
PeCDF Total	4.52E-02				4.72E-04		
HxCDF Total	3.85E-02				4.03E-04		
HpCDF Total	2.24E-02				2.34E-04		
OCDF	7.80E-03				8.15E-05		
PCDD Total	1.94E-01				2.02E-03		
PCDF Total	2.22E-01				2.32E-03		
PCDD/PCDF Total	4.15E-01				4.34E-03		
PCDD TEQ Total			2.78E-03	2.78E-03		2.90E-05	2.90E-05
PCDF TEQ Total			4.35E-03	4.35E-03		4.55E-05	4.55E-05
PCDD/PCDF TEQ Total			7.13E-03	7.13E-03		7.45E-05	7.45E-05

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND=0	ND=LOD		ND=0	ND=LOD	
2,3,7,8 - TCDD	9.79E-06	9.79E-06	9.79E-06	4.56E-03	4.56E-03	4.56E-03
1,2,3,7,8 - PeCDD	1.96E-05	1.96E-05	1.96E-05	9.12E-03	9.12E-03	9.12E-03
1,2,3,4,7,8 - HxCDD	1.63E-05	1.63E-06	1.63E-06	7.60E-03	7.60E-04	7.60E-04
1,2,3,6,7,8 - HxCDD	3.59E-05	3.59E-06	3.59E-06	1.67E-02	1.67E-03	1.67E-03
1,2,3,7,8,9 - HxCDD	2.61E-05	2.61E-06	2.61E-06	1.22E-02	1.22E-03	1.22E-03
1,2,3,4,6,7,8 - HpCDD	3.36E-04	3.36E-06	3.36E-06	1.57E-01	1.57E-03	1.57E-03
1,2,3,4,6,7,8,9 - OCDD	8.29E-04	2.49E-07	2.49E-07	3.86E-01	1.16E-04	1.16E-04
2,3,7,8 - TCDF	1.11E-04	1.11E-05	1.11E-05	5.17E-02	5.17E-03	5.17E-03
1,2,3,7,8 - PeCDF	3.92E-05	1.18E-06	1.18E-06	1.82E-02	5.47E-04	5.47E-04
2,3,4,7,8 - PeCDF	8.81E-05	2.64E-05	2.64E-05	4.10E-02	1.23E-02	1.23E-02
1,2,3,4,7,8 - HxCDF	6.53E-05	6.53E-06	6.53E-06	3.04E-02	3.04E-03	3.04E-03
1,2,3,6,7,8 - HxCDF	5.55E-05	5.55E-06	5.55E-06	2.58E-02	2.58E-03	2.58E-03
1,2,3,7,8,9 - HxCDF	3.26E-05	3.26E-06	3.26E-06	1.52E-02	1.52E-03	1.52E-03
2,3,4,6,7,8 - HxCDF	7.83E-05	7.83E-06	7.83E-06	3.65E-02	3.65E-03	3.65E-03
1,2,3,4,6,7,8 - HpCDF	1.70E-04	1.70E-06	1.70E-06	7.90E-02	7.90E-04	7.90E-04
1,2,3,4,7,8,9 - HpCDF	2.94E-05	2.94E-07	2.94E-07	1.37E-02	1.37E-04	1.37E-04
1,2,3,4,6,7,8,9 - OCDF	1.14E-04	3.43E-08	3.43E-08	5.32E-02	1.60E-05	1.60E-05
TeCDD Total	5.92E-04			2.76E-01		
PeCDD Total	4.37E-04			2.04E-01		
HxCDD Total	4.01E-04			1.86E-01		
HpCDD Total	5.86E-04			2.73E-01		
OCDD	8.28E-04			3.86E-01		
TeCDF Total	1.58E-03			7.36E-01		
PeCDF Total	6.64E-04			3.09E-01		
HxCDF Total	5.66E-04			2.64E-01		
HpCDF Total	3.30E-04			1.53E-01		
OCDF	1.15E-04			5.33E-02		
PCDD Total	2.84E-03			1.32E+00		
PCDF Total	3.26E-03			1.52E+00		
PCDD/PCDF Total	6.10E-03			2.84E+00		
PCDD TEQ Total		4.08E-05	4.08E-05		1.90E-02	1.90E-02
PCDF TEQ Total		6.39E-05	6.39E-05		2.98E-02	2.98E-02
PCDD/PCDF TEQ Total		1.05E-04	1.05E-04		4.88E-02	4.88E-02

Table A-12. PCDD/PCDF data for NWS 4.

PCDD/PCDF

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Sample ID PS-PCDD-NWS4-SVOC-121014-01
 Sampling volume (m³) 52.3
 Carbon sampled (g) 65.8
 Carbon sampled (mg/m³) 1257.7
 Carbon fraction 0.4656

Isomer.	Total	LOD	TEQ ng/sample	TEQ ng/sample ND = LOD	Total ng/m ³	TEQ ng/m ³	TEQ ng/m ³
	ng/sample	ng/sample	ND = 0		ND = 0	ND = LOD	
2,3,7,8 - TCDD	ND	5.56E-04	0.00E+00	5.56E-04	ND	0.00E+00	1.06E-05
1,2,3,7,8 - PeCDD	1.56E-03		1.56E-03	1.56E-03	2.97E-05	2.97E-05	2.97E-05
1,2,3,4,7,8 - HxCDD	8.89E-04		8.89E-05	8.89E-05	1.70E-05	1.70E-06	1.70E-06
1,2,3,6,7,8 - HxCDD	1.11E-03		1.11E-04	1.11E-04	2.12E-05	2.12E-06	2.12E-06
1,2,3,7,8,9 - HxCDD	1.56E-03		1.56E-04	1.56E-04	2.97E-05	2.97E-06	2.97E-06
1,2,3,4,6,7,8 - HpCDD	1.58E-02		1.58E-04	1.58E-04	3.01E-04	3.01E-06	3.01E-06
1,2,3,4,6,7,8,9 - OCDD	3.49E-02		1.05E-05	1.05E-05	6.67E-04	2.00E-07	2.00E-07
2,3,7,8 - TCDF	5.33E-03		5.33E-04	5.33E-04	1.02E-04	1.02E-05	1.02E-05
1,2,3,7,8 - PeCDF	2.67E-03		8.00E-05	8.00E-05	5.09E-05	1.53E-06	1.53E-06
2,3,4,7,8 - PeCDF	4.67E-03		1.40E-03	1.40E-03	8.92E-05	2.67E-05	2.67E-05
1,2,3,4,7,8 - HxCDF	4.67E-03		4.67E-04	4.67E-04	8.92E-05	8.92E-06	8.92E-06
1,2,3,6,7,8 - HxCDF	3.33E-03		3.33E-04	3.33E-04	6.37E-05	6.37E-06	6.37E-06
1,2,3,7,8,9 - HxCDF	1.33E-03		1.33E-04	1.33E-04	2.55E-05	2.55E-06	2.55E-06
2,3,4,6,7,8 - HxCDF	5.11E-03		5.11E-04	5.11E-04	9.77E-05	9.77E-06	9.77E-06
1,2,3,4,6,7,8 - HpCDF	9.78E-03		9.78E-05	9.78E-05	1.87E-04	1.87E-06	1.87E-06
1,2,3,4,7,8,9 - HpCDF	1.11E-03		1.11E-05	1.11E-05	2.12E-05	2.12E-07	2.12E-07
1,2,3,4,6,7,8,9 - OCDF	4.67E-03		1.40E-06	1.40E-06	8.92E-05	2.67E-08	2.67E-08
TeCDD Total	4.77E-02				9.11E-04		
PeCDD Total	2.65E-02				5.06E-04		
HxCDD Total	2.34E-02				4.46E-04		
HpCDD Total	2.89E-02				5.53E-04		
OCDD	3.48E-02				6.65E-04		
TeCDF Total	1.08E-01				2.07E-03		
PeCDF Total	4.90E-02				9.36E-04		
HxCDF Total	3.48E-02				6.64E-04		
HpCDF Total	1.79E-02				3.42E-04		
OCDF	4.69E-03				8.96E-05		
PCDD Total	1.61E-01				3.08E-03		
PCDF Total	2.15E-01				4.10E-03		
PCDD/PCDF Total	3.76E-01				7.18E-03		
PCDD TEQ Total			2.08E-03	2.63E-03		3.97E-05	5.03E-05
PCDF TEQ Total			3.57E-03	3.57E-03		6.82E-05	6.82E-05
PCDD/PCDF TEQ Total			5.65E-03	6.20E-03		1.08E-04	1.19E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	ND	0.00E+00	8.44E-06	ND	0.00E+00	3.93E-03
1,2,3,7,8 - PeCDD	2.36E-05	2.36E-05	2.36E-05	1.10E-02	1.10E-02	1.10E-02
1,2,3,4,7,8 - HxCDD	1.35E-05	1.35E-06	1.35E-06	6.29E-03	6.29E-04	6.29E-04
1,2,3,6,7,8 - HxCDD	1.69E-05	1.69E-06	1.69E-06	7.86E-03	7.86E-04	7.86E-04
1,2,3,7,8,9 - HxCDD	2.36E-05	2.36E-06	2.36E-06	1.10E-02	1.10E-03	1.10E-03
1,2,3,4,6,7,8 - HpCDD	2.40E-04	2.40E-06	2.40E-06	1.12E-01	1.12E-03	1.12E-03
1,2,3,4,6,7,8,9 - OCDD	5.30E-04	1.59E-07	1.59E-07	2.47E-01	7.40E-05	7.40E-05
2,3,7,8 - TCDF	8.10E-05	8.10E-06	8.10E-06	3.77E-02	3.77E-03	3.77E-03
1,2,3,7,8 - PeCDF	4.05E-05	1.22E-06	1.22E-06	1.89E-02	5.66E-04	5.66E-04
2,3,4,7,8 - PeCDF	7.09E-05	2.13E-05	2.13E-05	3.30E-02	9.90E-03	9.90E-03
1,2,3,4,7,8 - HxCDF	7.09E-05	7.09E-06	7.09E-06	3.30E-02	3.30E-03	3.30E-03
1,2,3,6,7,8 - HxCDF	5.06E-05	5.06E-06	5.06E-06	2.36E-02	2.36E-03	2.36E-03
1,2,3,7,8,9 - HxCDF	2.03E-05	2.03E-06	2.03E-06	9.43E-03	9.43E-04	9.43E-04
2,3,4,6,7,8 - HxCDF	7.76E-05	7.76E-06	7.76E-06	3.62E-02	3.62E-03	3.62E-03
1,2,3,4,6,7,8 - HpCDF	1.49E-04	1.49E-06	1.49E-06	6.92E-02	6.92E-04	6.92E-04
1,2,3,4,7,8,9 - HpCDF	1.69E-05	1.69E-07	1.69E-07	7.86E-03	7.86E-05	7.86E-05
1,2,3,4,6,7,8,9 - OCDF	7.09E-05	2.13E-08	2.13E-08	3.30E-02	9.90E-06	9.90E-06
TeCDD Total	7.24E-04			3.37E-01		
PeCDD Total	4.02E-04			1.87E-01		
HxCDD Total	3.55E-04			1.65E-01		
HpCDD Total	4.40E-04			2.05E-01		
OCDD	5.29E-04			2.46E-01		
TeCDF Total	1.65E-03			7.67E-01		
PeCDF Total	7.44E-04			3.46E-01		
HxCDF Total	5.28E-04			2.46E-01		
HpCDF Total	2.72E-04			1.27E-01		
OCDF	7.12E-05			3.32E-02		
PCDD Total	2.45E-03			1.14E+00		
PCDF Total	3.26E-03			1.52E+00		
PCDD/PCDF Total	5.71E-03			2.66E+00		
PCDD TEQ Total		3.16E-05	4.00E-05		1.47E-02	1.86E-02
PCDF TEQ Total		5.42E-05	5.42E-05		2.52E-02	2.52E-02
PCDD/PCDF TEQ Total		8.58E-05	9.42E-05		3.99E-02	4.39E-02

Table A-13. PCDD/PCDF data for SB/SL 1.

Sample ID PS-PCDD-SB-SVOC-112014-01
 Sampling volume (m³) 60.2
 Carbon sampled (g) 68.1
 Carbon sampled (mg/m³) 1129.9
 Carbon fraction 0.45215

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	1.56E-03		1.56E-03	1.56E-03	2.58E-05	2.58E-05	2.58E-05
1,2,3,7,8 - PeCDD	7.33E-03		7.33E-03	7.33E-03	1.22E-04	1.22E-04	1.22E-04
1,2,3,4,7,8 - HxCDD	4.89E-03		4.89E-04	4.89E-04	8.11E-05	8.11E-06	8.11E-06
1,2,3,6,7,8 - HxCDD	1.49E-02		1.49E-03	1.49E-03	2.47E-04	2.47E-05	2.47E-05
1,2,3,7,8,9 - HxCDD	1.09E-02		1.09E-03	1.09E-03	1.81E-04	1.81E-05	1.81E-05
1,2,3,4,6,7,8 - HpCDD	2.44E-01		2.44E-03	2.44E-03	4.05E-03	4.05E-05	4.05E-05
1,2,3,4,6,7,8,9 - OCDD	7.46E-01		2.24E-04	2.24E-04	1.24E-02	3.71E-06	3.71E-06
2,3,7,8 - TCDF	2.64E-02		2.64E-03	2.64E-03	4.39E-04	4.39E-05	4.39E-05
1,2,3,7,8 - PeCDF	8.67E-03		2.60E-04	2.60E-04	1.44E-04	4.32E-06	4.32E-06
2,3,4,7,8 - PeCDF	1.27E-02		3.80E-03	3.80E-03	2.10E-04	6.31E-05	6.31E-05
1,2,3,4,7,8 - HxCDF	7.78E-03		7.78E-04	7.78E-04	1.29E-04	1.29E-05	1.29E-05
1,2,3,6,7,8 - HxCDF	5.11E-03		5.11E-04	5.11E-04	8.48E-05	8.48E-06	8.48E-06
1,2,3,7,8,9 - HxCDF	2.44E-03		2.44E-04	2.44E-04	4.06E-05	4.06E-06	4.06E-06
2,3,4,6,7,8 - HxCDF	7.78E-03		7.78E-04	7.78E-04	1.29E-04	1.29E-05	1.29E-05
1,2,3,4,6,7,8 - HpCDF	1.69E-02		1.69E-04	1.69E-04	2.80E-04	2.80E-06	2.80E-06
1,2,3,4,7,8,9 - HpCDF	2.89E-03		2.89E-05	2.89E-05	4.79E-05	4.79E-07	4.79E-07
1,2,3,4,6,7,8,9 - OCDF	2.09E-02		6.27E-06	6.27E-06	3.47E-04	1.04E-07	1.04E-07
TeCDD Total	7.68E-02				1.28E-03		
PeCDD Total	5.64E-02				9.36E-04		
HxCDD Total	1.25E-01				2.08E-03		
HxCDF Total	3.87E-01				6.43E-03		
OCDD	7.46E-01				1.24E-02		
TeCDF Total	3.20E-01				5.31E-03		
PeCDF Total	1.08E-01				1.80E-03		
HxCDF Total	5.62E-02				9.32E-04		
HpCDF Total	4.23E-02				7.02E-04		
OCDF	2.08E-02				3.46E-04		
PCDD Total	1.39E+00				2.31E-02		
PCDF Total	5.47E-01				9.09E-03		
PCDD/PCDF Total	1.94E+00				3.22E-02		
PCDD TEQ Total			1.46E-02	1.46E-02		2.43E-04	2.43E-04
PCDF TEQ Total			9.22E-03	9.22E-03		1.53E-04	1.53E-04
PCDD/PCDF TEQ Total			2.38E-02	2.38E-02		3.96E-04	3.96E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	2.29E-05	2.29E-05	2.29E-05	1.03E-02	1.03E-02	1.03E-02
1,2,3,7,8 - PeCDD	1.08E-04	1.08E-04	1.08E-04	4.87E-02	4.87E-02	4.87E-02
1,2,3,4,7,8 - HxCDD	7.18E-05	7.18E-06	7.18E-06	3.25E-02	3.25E-03	3.25E-03
1,2,3,6,7,8 - HxCDD	2.19E-04	2.19E-05	2.19E-05	9.89E-02	9.89E-03	9.89E-03
1,2,3,7,8,9 - HxCDD	1.60E-04	1.60E-05	1.60E-05	7.23E-02	7.23E-03	7.23E-03
1,2,3,4,6,7,8 - HpCDD	3.58E-03	3.58E-05	3.58E-05	1.62E+00	1.62E-02	1.62E-02
1,2,3,4,6,7,8,9 - OCDD	1.10E-02	3.29E-06	3.29E-06	4.95E+00	1.49E-03	1.49E-03
2,3,7,8 - TCDF	3.88E-04	3.88E-05	3.88E-05	1.76E-01	1.76E-02	1.76E-02
1,2,3,7,8 - PeCDF	1.27E-04	3.82E-06	3.82E-06	5.76E-02	1.73E-03	1.73E-03
2,3,4,7,8 - PeCDF	1.86E-04	5.58E-05	5.58E-05	8.41E-02	2.52E-02	2.52E-02
1,2,3,4,7,8 - HxCDF	1.14E-04	1.14E-05	1.14E-05	5.17E-02	5.17E-03	5.17E-03
1,2,3,6,7,8 - HxCDF	7.51E-05	7.51E-06	7.51E-06	3.39E-02	3.39E-03	3.39E-03
1,2,3,7,8,9 - HxCDF	3.59E-05	3.59E-06	3.59E-06	1.62E-02	1.62E-03	1.62E-03
2,3,4,6,7,8 - HxCDF	1.14E-04	1.14E-05	1.14E-05	5.17E-02	5.17E-03	5.17E-03
1,2,3,4,6,7,8 - HpCDF	2.48E-04	2.48E-06	2.48E-06	1.12E-01	1.12E-03	1.12E-03
1,2,3,4,7,8,9 - HpCDF	4.24E-05	4.24E-07	4.24E-07	1.92E-02	1.92E-04	1.92E-04
1,2,3,4,6,7,8,9 - OCDF	3.07E-04	9.21E-08	9.21E-08	1.39E-01	4.16E-05	4.16E-05
TeCDD Total	1.13E-03			5.10E-01		
PeCDD Total	8.29E-04			3.75E-01		
HxCDD Total	1.84E-03			8.32E-01		
HpCDD Total	5.69E-03			2.57E+00		
OCDD	1.10E-02			4.95E+00		
TeCDF Total	4.70E-03			2.12E+00		
PeCDF Total	1.59E-03			7.20E-01		
HxCDF Total	8.25E-04			3.73E-01		
HpCDF Total	6.21E-04			2.81E-01		
OCDF	3.06E-04			1.38E-01		
PCDD Total	2.04E-02			9.24E+00		
PCDF Total	8.04E-03			3.64E+00		
PCDD/PCDF Total	2.85E-02			1.29E+01		
PCDD TEQ Total		2.15E-04	2.15E-04		9.71E-02	9.71E-02
PCDF TEQ Total		1.35E-04	1.35E-04		6.12E-02	6.12E-02
PCDD/PCDF TEQ Total		3.50E-04	3.50E-04		1.58E-01	1.58E-01

Table A-14. PCDD/PCDF data for SB/SL 2.

PCDD/PCDF

Page 1 (2)

Sample ID PS-PCDD-SB2-SVOC-11212014-02
 Sampling volume (m³) 56.4
 Carbon sampled (g) 63.4
 Carbon sampled (mg/m³) 1123.4
 Carbon fraction 0.452

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample	ND = 0	ng/m ³	ng/m ³	ng/m ³
2,3,7,8 - TCDD	2.00E-03		2.00E-03	2.00E-03	3.54E-05	3.54E-05	3.54E-05
1,2,3,7,8 - PeCDD	6.89E-03		6.89E-03	6.89E-03	1.22E-04	1.22E-04	1.22E-04
1,2,3,4,7,8 - HxCDD	4.22E-03		4.22E-04	4.22E-04	7.48E-05	7.48E-06	7.48E-06
1,2,3,6,7,8 - HxCDD	1.44E-02		1.44E-03	1.44E-03	2.56E-04	2.56E-05	2.56E-05
1,2,3,7,8,9 - HxCDD	1.00E-02		1.00E-03	1.00E-03	1.77E-04	1.77E-05	1.77E-05
1,2,3,4,6,7,8 - HpCDD	2.14E-01		2.14E-03	2.14E-03	3.79E-03	3.79E-05	3.79E-05
1,2,3,4,6,7,8,9 - OCDD	6.48E-01		1.94E-04	1.94E-04	1.15E-02	3.45E-06	3.45E-06
2,3,7,8 - TCDF	4.16E-02		4.16E-03	4.16E-03	7.37E-04	7.37E-05	7.37E-05
1,2,3,7,8 - PeCDF	1.09E-02		3.27E-04	3.27E-04	1.93E-04	5.79E-06	5.79E-06
2,3,4,7,8 - PeCDF	1.36E-02		4.07E-03	4.07E-03	2.40E-04	7.21E-05	7.21E-05
1,2,3,4,7,8 - HxCDF	6.67E-03		6.67E-04	6.67E-04	1.18E-04	1.18E-05	1.18E-05
1,2,3,6,7,8 - HxCDF	4.44E-03		4.44E-04	4.44E-04	7.88E-05	7.88E-06	7.88E-06
1,2,3,7,8,9 - HxCDF	1.78E-03		1.78E-04	1.78E-04	3.15E-05	3.15E-06	3.15E-06
2,3,4,6,7,8 - HxCDF	5.33E-03		5.33E-04	5.33E-04	9.45E-05	9.45E-06	9.45E-06
1,2,3,4,6,7,8 - HpCDF	1.38E-02		1.38E-04	1.38E-04	2.44E-04	2.44E-06	2.44E-06
1,2,3,4,7,8,9 - HpCDF	2.00E-03		2.00E-05	2.00E-05	3.54E-05	3.54E-07	3.54E-07
1,2,3,4,6,7,8,9 - OCDF	1.84E-02		5.53E-06	5.53E-06	3.27E-04	9.81E-08	9.81E-08
TeCDD Total	6.59E-02				1.17E-03		
PeCDD Total	5.67E-02				1.00E-03		
HxCDD Total	1.15E-01				2.05E-03		
HxCDF Total	3.40E-01				6.03E-03		
OCDD	6.48E-01				1.15E-02		
TeCDF Total	3.86E-01				6.84E-03		
PeCDF Total	1.39E-01				2.47E-03		
HxCDF Total	4.55E-02				8.06E-04		
HpCDF Total	3.82E-02				6.78E-04		
OCDF	1.84E-02				3.26E-04		
PCDD Total	1.23E+00				2.17E-02		
PCDF Total	6.27E-01				1.11E-02		
PCDD/PCDF Total	1.85E+00				3.28E-02		
PCDD TEQ Total			1.41E-02	1.41E-02		2.50E-04	2.50E-04
PCDF TEQ Total			1.05E-02	1.05E-02		1.87E-04	1.87E-04
PCDD/PCDF TEQ Total			2.46E-02	2.46E-02		4.36E-04	4.36E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	3.16E-05	3.16E-05	3.16E-05	1.43E-02	1.43E-02	1.43E-02
1,2,3,7,8 - PeCDD	1.09E-04	1.09E-04	1.09E-04	4.91E-02	4.91E-02	4.91E-02
1,2,3,4,7,8 - HxCDD	6.66E-05	6.66E-06	6.66E-06	3.01E-02	3.01E-03	3.01E-03
1,2,3,6,7,8 - HxCDD	2.28E-04	2.28E-05	2.28E-05	1.03E-01	1.03E-02	1.03E-02
1,2,3,7,8,9 - HxCDD	1.58E-04	1.58E-05	1.58E-05	7.13E-02	7.13E-03	7.13E-03
1,2,3,4,6,7,8 - HpCDD	3.37E-03	3.37E-05	3.37E-05	1.52E+00	1.52E-02	1.52E-02
1,2,3,4,6,7,8,9 - OCDD	1.02E-02	3.07E-06	3.07E-06	4.62E+00	1.39E-03	1.39E-03
2,3,7,8 - TCDF	6.56E-04	6.56E-05	6.56E-05	2.96E-01	2.96E-02	2.96E-02
1,2,3,7,8 - PeCDF	1.72E-04	5.15E-06	5.15E-06	7.77E-02	2.33E-03	2.33E-03
2,3,4,7,8 - PeCDF	2.14E-04	6.42E-05	6.42E-05	9.67E-02	2.90E-02	2.90E-02
1,2,3,4,7,8 - HxCDF	1.05E-04	1.05E-05	1.05E-05	4.76E-02	4.76E-03	4.76E-03
1,2,3,6,7,8 - HxCDF	7.01E-05	7.01E-06	7.01E-06	3.17E-02	3.17E-03	3.17E-03
1,2,3,7,8,9 - HxCDF	2.80E-05	2.80E-06	2.80E-06	1.27E-02	1.27E-03	1.27E-03
2,3,4,6,7,8 - HxCDF	8.41E-05	8.41E-06	8.41E-06	3.80E-02	3.80E-03	3.80E-03
1,2,3,4,6,7,8 - HpCDF	2.17E-04	2.17E-06	2.17E-06	9.83E-02	9.83E-04	9.83E-04
1,2,3,4,7,8,9 - HpCDF	3.16E-05	3.16E-07	3.16E-07	1.43E-02	1.43E-04	1.43E-04
1,2,3,4,6,7,8,9 - OCDF	2.91E-04	8.73E-08	8.73E-08	1.32E-01	3.95E-05	3.95E-05
TeCDD Total	1.04E-03			4.70E-01		
PeCDD Total	8.94E-04			4.04E-01		
HxCDD Total	1.82E-03			8.24E-01		
HpCDD Total	5.37E-03			2.43E+00		
OCDD	1.02E-02			4.62E+00		
TeCDF Total	6.09E-03			2.75E+00		
PeCDF Total	2.19E-03			9.92E-01		
HxCDF Total	7.18E-04			3.24E-01		
HpCDF Total	6.03E-04			2.73E-01		
OCDF	2.90E-04			1.31E-01		
PCDD Total	1.93E-02			8.75E+00		
PCDF Total	9.90E-03			4.47E+00		
PCDD/PCDF Total	2.92E-02			1.32E+01		
PCDD TEQ Total		2.22E-04	2.22E-04		1.00E-01	1.00E-01
PCDF TEQ Total		1.66E-04	1.66E-04		7.51E-02	7.51E-02
PCDD/PCDF TEQ Total		3.88E-04	3.88E-04		1.76E-01	1.76E-01

Table A-15. PCDD/PCDF data for SB/SL 3.

PCDD/PCDF

Sample ID

PS-PCDD-SB3-SVOC-120314-01

MCE 0.969

Sampling volume (m ³)	73.1
Carbon sampled (g)	49.7
Carbon sampled (mg/m ³)	679.5
Carbon fraction	0.4522

Isomer.	Total ng/sample	LOD ng/sample	TEQ	TEQ	Total	TEQ	TEQ
			ng/sample ND = 0	ng/sample ND = LOD	ng/m3 ND = 0	ng/m3 ND = LOD	ng/m3 ND = 0
2,3,7,8 - TCDD	4.89E-03		4.89E-03	4.89E-03	6.69E-05	6.69E-05	6.69E-05
1,2,3,7,8 - PeCDD	2.22E-02		2.22E-02	2.22E-02	3.04E-04	3.04E-04	3.04E-04
1,2,3,4,7,8 - HxCDD	1.24E-02		1.24E-03	1.24E-03	1.70E-04	1.70E-05	1.70E-05
1,2,3,6,7,8 - HxCDD	3.80E-02		3.80E-03	3.80E-03	5.20E-04	5.20E-05	5.20E-05
1,2,3,7,8,9 - HxCDD	2.89E-02		2.89E-03	2.89E-03	3.95E-04	3.95E-05	3.95E-05
1,2,3,4,6,7,8 - HpCDD	4.43E-01		4.43E-03	4.43E-03	6.06E-03	6.06E-05	6.06E-05
1,2,3,4,6,7,8,9 - OCDD	1.13E+00		3.38E-04	3.38E-04	1.54E-02	4.62E-06	4.62E-06
2,3,7,8 - TCDF	2.58E-02		2.58E-03	2.58E-03	3.53E-04	3.53E-05	3.53E-05
1,2,3,7,8 - PeCDF	7.33E-03		2.20E-04	2.20E-04	1.00E-04	3.01E-06	3.01E-06
2,3,4,7,8 - PeCDF	8.44E-03		2.53E-03	2.53E-03	1.15E-04	3.46E-05	3.46E-05
1,2,3,4,7,8 - HxCDF	3.56E-03		3.56E-04	3.56E-04	4.86E-05	4.86E-06	4.86E-06
1,2,3,6,7,8 - HxCDF	4.22E-03		4.22E-04	4.22E-04	5.77E-05	5.77E-06	5.77E-06
1,2,3,7,8,9 - HxCDF	1.56E-03		1.56E-04	1.56E-04	2.13E-05	2.13E-06	2.13E-06
2,3,4,6,7,8 - HxCDF	5.56E-03		5.56E-04	5.56E-04	7.60E-05	7.60E-06	7.60E-06
1,2,3,4,6,7,8 - HpCDF	1.67E-02		1.67E-04	1.67E-04	2.28E-04	2.28E-06	2.28E-06
1,2,3,4,7,8,9 - HpCDF	3.33E-03		3.33E-05	3.33E-05	4.56E-05	4.56E-07	4.56E-07
1,2,3,4,6,7,8,9 - OCDF	2.20E-02		6.60E-06	6.60E-06	3.01E-04	9.03E-08	9.03E-08
TeCDD Total	1.26E-01				1.73E-03		
PeCDD Total	1.36E-01				1.86E-03		
HxCDD Total	3.09E-01				4.22E-03		
HpCDD Total	7.06E-01				9.65E-03		
OCDD	1.13E+00				1.54E-02		
TeCDF Total	2.98E-01				4.08E-03		
PeCDF Total	8.80E-02				1.20E-03		
HxCDF Total	4.13E-02				5.65E-04		
HpCDF Total	4.74E-02				6.48E-04		
OCDF	2.20E-02				3.01E-04		
PCDD Total	2.40E+00				3.29E-02		
PCDF Total	4.97E-01				6.80E-03		
PCDD/PCDF Total	2.90E+00				3.97E-02		
PCDD TEQ Total			3.98E-02	3.98E-02		5.44E-04	5.44E-04
PCDF TEQ Total			7.03E-03	7.03E-03		9.61E-05	9.61E-05
PCDD/PCDF TEQ Total			4.68E-02	4.68E-02		6.41E-04	6.41E-04

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	9.84E-05	9.84E-05	9.84E-05	4.45E-02	4.45E-02	4.45E-02
1,2,3,7,8 - PeCDD	4.47E-04	4.47E-04	4.47E-04	2.02E-01	2.02E-01	2.02E-01
1,2,3,4,7,8 - HxCDD	2.50E-04	2.50E-05	2.50E-05	1.13E-01	1.13E-02	1.13E-02
1,2,3,6,7,8 - HxCDD	7.65E-04	7.65E-05	7.65E-05	3.46E-01	3.46E-02	3.46E-02
1,2,3,7,8,9 - HxCDD	5.81E-04	5.81E-05	5.81E-05	2.63E-01	2.63E-02	2.63E-02
1,2,3,4,6,7,8 - HpCDD	8.91E-03	8.91E-05	8.91E-05	4.03E+00	4.03E-02	4.03E-02
1,2,3,4,6,7,8,9 - OCDD	2.27E-02	6.81E-06	6.81E-06	1.03E+01	3.08E-03	3.08E-03
2,3,7,8 - TCDF	5.19E-04	5.19E-05	5.19E-05	2.35E-01	2.35E-02	2.35E-02
1,2,3,7,8 - PeCDF	1.48E-04	4.43E-06	4.43E-06	6.67E-02	2.00E-03	2.00E-03
2,3,4,7,8 - PeCDF	1.70E-04	5.10E-05	5.10E-05	7.68E-02	2.31E-02	2.31E-02
1,2,3,4,7,8 - HxCDF	7.16E-05	7.16E-06	7.16E-06	3.24E-02	3.24E-03	3.24E-03
1,2,3,6,7,8 - HxCDF	8.50E-05	8.50E-06	8.50E-06	3.84E-02	3.84E-03	3.84E-03
1,2,3,7,8,9 - HxCDF	3.13E-05	3.13E-06	3.13E-06	1.42E-02	1.42E-03	1.42E-03
2,3,4,6,7,8 - HxCDF	1.12E-04	1.12E-05	1.12E-05	5.06E-02	5.06E-03	5.06E-03
1,2,3,4,6,7,8 - HpCDF	3.35E-04	3.35E-06	3.35E-06	1.52E-01	1.52E-03	1.52E-03
1,2,3,4,7,8,9 - HpCDF	6.71E-05	6.71E-07	6.71E-07	3.03E-02	3.03E-04	3.03E-04
1,2,3,4,6,7,8,9 - OCDF	4.43E-04	1.33E-07	1.33E-07	2.00E-01	6.01E-05	6.01E-05
TeCDD Total	2.54E-03			1.15E+00		
PeCDD Total	2.73E-03			1.24E+00		
HxCDD Total	6.21E-03			2.81E+00		
HpCDD Total	1.42E-02			6.42E+00		
OCDD	2.27E-02			1.03E+01		
TeCDF Total	6.01E-03			2.72E+00		
PeCDF Total	1.77E-03			8.01E-01		
HxCDF Total	8.31E-04			3.76E-01		
HpCDF Total	9.54E-04			4.31E-01		
OCDF	4.43E-04			2.00E-01		
PCDD Total	4.84E-02			2.19E+01		
PCDF Total	1.00E-02			4.52E+00		
PCDD/PCDF Total	5.84E-02			2.64E+01		
PCDD TEQ Total		8.01E-04	8.01E-04		3.62E-01	3.62E-01
PCDF TEQ Total		1.41E-04	1.41E-04		6.39E-02	6.39E-02
PCDD/PCDF TEQ Total		9.43E-04	9.43E-04		4.26E-01	4.26E-01

825 Table A-16. PCDD/PCDF data for SB/SL 4.

PCDD/PCDF

Sample ID

PS-PCDD-SB4-SVOC-120414-01

MCE 0.971

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Sampling volume (m ³)	96.4
Carbon sampled (g)	63.3
Carbon sampled (mg/m ³)	656.4
Carbon fraction	0.4522

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	5.78E-03		5.78E-03	5.78E-03	5.99E-05	5.99E-05	5.99E-05
1,2,3,7,8 - PeCDD	2.40E-02		2.40E-02	2.40E-02	2.49E-04	2.49E-04	2.49E-04
1,2,3,4,7,8 - HxCDD	1.29E-02		1.29E-03	1.29E-03	1.34E-04	1.34E-05	1.34E-05
1,2,3,6,7,8 - HxCDD	3.93E-02		3.93E-03	3.93E-03	4.08E-04	4.08E-05	4.08E-05
1,2,3,7,8,9 - HxCDD	2.96E-02		2.96E-03	2.96E-03	3.07E-04	3.07E-05	3.07E-05
1,2,3,4,6,7,8 - HpCDD	4.08E-01		4.08E-03	4.08E-03	4.23E-03	4.23E-05	4.23E-05
1,2,3,4,6,7,8,9 - OCDD	1.06E+00		3.17E-04	3.17E-04	1.10E-02	3.29E-06	3.29E-06
2,3,7,8 - TCDF	3.44E-02		3.44E-03	3.44E-03	3.57E-04	3.57E-05	3.57E-05
1,2,3,7,8 - PeCDF	9.56E-03		2.87E-04	2.87E-04	9.91E-05	2.97E-06	2.97E-06
2,3,4,7,8 - PeCDF	1.18E-02		3.53E-03	3.53E-03	1.22E-04	3.67E-05	3.67E-05
1,2,3,4,7,8 - HxCDF	6.89E-03		6.89E-04	6.89E-04	7.15E-05	7.15E-06	7.15E-06
1,2,3,6,7,8 - HxCDF	5.11E-03		5.11E-04	5.11E-04	5.30E-05	5.30E-06	5.30E-06
1,2,3,7,8,9 - HxCDF	1.78E-03		1.78E-04	1.78E-04	1.84E-05	1.84E-06	1.84E-06
2,3,4,6,7,8 - HxCDF	6.00E-03		6.00E-04	6.00E-04	6.22E-05	6.22E-06	6.22E-06
1,2,3,4,6,7,8 - HpCDF	1.80E-02		1.80E-04	1.80E-04	1.87E-04	1.87E-06	1.87E-06
1,2,3,4,7,8,9 - HpCDF	3.56E-03		3.56E-05	3.56E-05	3.69E-05	3.69E-07	3.69E-07
1,2,3,4,6,7,8,9 - OCDF	2.49E-02		7.47E-06	7.47E-06	2.58E-04	7.75E-08	7.75E-08
TeCDD Total	1.71E-01				1.78E-03		
PeCDD Total	1.66E-01				1.72E-03		
HxCDD Total	3.13E-01				3.25E-03		
HpCDD Total	6.63E-01				6.88E-03		
OCDD	1.06E+00				1.10E-02		
TeCDF Total	4.17E-01				4.32E-03		
PeCDF Total	1.17E-01				1.22E-03		
HxCDF Total	5.09E-02				5.28E-04		
HpCDF Total	4.99E-02				5.18E-04		
OCDF	2.49E-02				2.59E-04		
PCDD Total	2.37E+00				2.46E-02		
PCDF Total	6.60E-01				6.84E-03		
PCDD/PCDF Total	3.03E+00				3.14E-02		
PCDD TEQ Total			4.24E-02	4.24E-02		4.39E-04	4.39E-04
PCDF TEQ Total			9.47E-03	9.47E-03		9.82E-05	9.82E-05
PCDD/PCDF TEQ Total			5.18E-02	5.18E-02		5.38E-04	5.38E-04

EF	EF	EF	EF	EF	EF
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Isomer.	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fiberboard			
	ND = 0	ND = LOD	ND = 0	ND = LOD		
2,3,7,8 - TCDD	9.13E-05	9.13E-05	9.13E-05	4.13E-02	4.13E-02	4.13E-02
1,2,3,7,8 - PeCDD	3.79E-04	3.79E-04	3.79E-04	1.72E-01	1.72E-01	1.72E-01
1,2,3,4,7,8 - HxCDD	2.04E-04	2.04E-05	2.04E-05	9.21E-02	9.21E-03	9.21E-03
1,2,3,6,7,8 - HxCDD	6.22E-04	6.22E-05	6.22E-05	2.81E-01	2.81E-02	2.81E-02
1,2,3,7,8,9 - HxCDD	4.67E-04	4.67E-05	4.67E-05	2.11E-01	2.11E-02	2.11E-02
1,2,3,4,6,7,8 - HpCDD	6.44E-03	6.44E-05	6.44E-05	2.91E+00	2.91E-02	2.91E-02
1,2,3,4,6,7,8,9 - OCDD	1.67E-02	5.02E-06	5.02E-06	7.56E+00	2.27E-03	2.27E-03
2,3,7,8 - TCDF	5.44E-04	5.44E-05	5.44E-05	2.46E-01	2.46E-02	2.46E-02
1,2,3,7,8 - PeCDF	1.51E-04	4.53E-06	4.53E-06	6.83E-02	2.05E-03	2.05E-03
2,3,4,7,8 - PeCDF	1.86E-04	5.58E-05	5.58E-05	8.42E-02	2.52E-02	2.52E-02
1,2,3,4,7,8 - HxCDF	1.09E-04	1.09E-05	1.09E-05	4.92E-02	4.92E-03	4.92E-03
1,2,3,6,7,8 - HxCDF	8.08E-05	8.08E-06	8.08E-06	3.65E-02	3.65E-03	3.65E-03
1,2,3,7,8,9 - HxCDF	2.81E-05	2.81E-06	2.81E-06	1.27E-02	1.27E-03	1.27E-03
2,3,4,6,7,8 - HxCDF	9.48E-05	9.48E-06	9.48E-06	4.29E-02	4.29E-03	4.29E-03
1,2,3,4,6,7,8 - HpCDF	2.84E-04	2.84E-06	2.84E-06	1.29E-01	1.29E-03	1.29E-03
1,2,3,4,7,8,9 - HpCDF	5.62E-05	5.62E-07	5.62E-07	2.54E-02	2.54E-04	2.54E-04
1,2,3,4,6,7,8,9 - OCDF	3.93E-04	1.18E-07	1.18E-07	1.78E-01	5.34E-05	5.34E-05
TeCDD Total	2.70E-03			1.22E+00		
PeCDD Total	2.62E-03			1.18E+00		
HxCDD Total	4.95E-03			2.24E+00		
HpCDD Total	1.05E-02			4.74E+00		
OCDD	1.67E-02			7.56E+00		
TeCDF Total	6.59E-03			2.98E+00		
PeCDF Total	1.85E-03			8.37E-01		
HxCDF Total	8.05E-04			3.64E-01		
HpCDF Total	7.88E-04			3.56E-01		
OCDF	3.94E-04			1.78E-01		
PCDD Total	3.75E-02			1.69E+01		
PCDF Total	1.04E-02			4.71E+00		
PCDD/PCDF Total	4.79E-02			2.17E+01		
PCDD TEQ Total		6.69E-04	6.69E-04		3.03E-01	3.03E-01
PCDF TEQ Total		1.50E-04	1.50E-04		6.76E-02	6.76E-02
PCDD/PCDF TEQ Total		8.19E-04	8.19E-04		3.70E-01	3.70E-01

830 Table A-16. Pre-test background PCDD/PCDF concentrations.

PCDD/PCDF - Ambient/Background concentrations

Sample ID BS-PCDD-SVOC-111414

Sampling volume (m³) 279.5

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Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	2.22E-04		2.22E-04	2.22E-04	7.95E-07	7.95E-07	7.95E-07
1,2,3,7,8 - PeCDD	8.89E-04		8.89E-04	8.89E-04	3.18E-06	3.18E-06	3.18E-06
1,2,3,4,7,8 - HxCDD	6.67E-04		6.67E-05	6.67E-05	2.38E-06	2.38E-07	2.38E-07
1,2,3,6,7,8 - HxCDD	1.33E-03		1.33E-04	1.33E-04	4.77E-06	4.77E-07	4.77E-07
1,2,3,7,8,9 - HxCDD	1.33E-03		1.33E-04	1.33E-04	4.77E-06	4.77E-07	4.77E-07
1,2,3,4,6,7,8 - HpCDD	1.76E-02		1.76E-04	1.76E-04	6.28E-05	6.28E-07	6.28E-07
1,2,3,4,6,7,8,9 - OCDD	4.96E-02		1.49E-05	1.49E-05	1.77E-04	5.32E-08	5.32E-08
2,3,7,8 - TCDF	6.67E-04		6.67E-05	6.67E-05	2.38E-06	2.38E-07	2.38E-07
1,2,3,7,8 - PeCDF	8.89E-04		2.67E-05	2.67E-05	3.18E-06	9.54E-08	9.54E-08
2,3,4,7,8 - PeCDF	6.67E-04		2.00E-04	2.00E-04	2.38E-06	7.15E-07	7.15E-07
1,2,3,4,7,8 - HxCDF	8.89E-04		8.89E-05	8.89E-05	3.18E-06	3.18E-07	3.18E-07
1,2,3,6,7,8 - HxCDF	8.89E-04		8.89E-05	8.89E-05	3.18E-06	3.18E-07	3.18E-07
1,2,3,7,8,9 - HxCDF	4.44E-04		4.44E-05	4.44E-05	1.59E-06	1.59E-07	1.59E-07
2,3,4,6,7,8 - HxCDF	1.33E-03		1.33E-04	1.33E-04	4.77E-06	4.77E-07	4.77E-07
1,2,3,4,6,7,8 - HpCDF	4.44E-03		4.44E-05	4.44E-05	1.59E-05	1.59E-07	1.59E-07
1,2,3,4,7,8,9 - HpCDF	6.67E-04		6.67E-06	6.67E-06	2.38E-06	2.38E-08	2.38E-08
1,2,3,4,6,7,8,9 - OCDF	4.22E-03		1.27E-06	1.27E-06	1.51E-05	4.53E-09	4.53E-09
TeCDD Total	1.17E-02				4.19E-05		
PeCDD Total	1.01E-02				3.63E-05		
HxCDD Total	1.66E-02				5.95E-05		
HpCDD Total	3.85E-02				1.38E-04		
OCDD	4.94E-02				1.77E-04		
TeCDF Total	2.84E-02				1.02E-04		
PeCDF Total	1.30E-02				4.66E-05		
HxCDF Total	6.78E-03				2.42E-05		
HpCDF Total	8.16E-03				2.92E-05		
OCDF	4.53E-03				1.62E-05		
PCDD Total	1.26E-01				4.52E-04		
PCDF Total	6.09E-02				2.18E-04		
PCDD/PCDF Total	1.87E-01				6.70E-04		
PCDD TEQ Total			1.63E-03	1.63E-03		5.85E-06	5.85E-06
PCDF TEQ Total			7.01E-04	7.01E-04		2.51E-06	2.51E-06
PCDD/PCDF TEQ Total			2.34E-03	2.34E-03		8.36E-06	8.36E-06

Table A-17. PAH emission factors for NWS.

PAH	NWS1	NWS3	NWS4
	mg/kg Fiberboard		
Naphthalene	11.48	51.89	21.57

Acenaphthylene	7.95	24.09	8.17
Acenaphthene	0.44	1.20	0.40
Fluorene	2.75	4.70	1.49
Phenanthrene	12.25	13.38	4.72
Anthracene	3.22	3.05	0.97
Fluoranthene	6.48	6.45	1.83
Pyrene	6.10	5.87	1.64
Benzo(a)anthracene	1.63	1.47	0.43
Chrysene	1.47	1.35	0.43
Benzo(b)fluoranthene	0.86	0.74	0.26
Benzo(k)fluoranthene	1.16	1.18	0.38
Benzo(a)pyrene	1.34	1.32	0.38
Indeno(1,2,3-cd)pyrene	0.87	0.82	0.27
Dibenz(a,h)anthracene	0.17	0.13	0.04
Benzo(ghi)perylene	0.91	0.96	0.30
SUM 16-EPA PAH	59.09	118.61	43.29

835 Table A-18. PAH emission factors for CB/CL.

PAH	CB1/CL1	CB2/CL2	CB3/CL3	CB4/CL4
	mg/kg Fiberboard			
Naphthalene	10.77	6.97	5.50	5.36
Acenaphthylene	5.35	3.03	2.35	2.37
Acenaphthene	0.30	0.14	0.12	0.11
Fluorene	1.21	0.66	0.55	0.54
Phenanthrene	4.30	2.81	2.47	2.34
Anthracene	0.91	0.57	0.50	0.46
Fluoranthene	2.46	1.52	1.27	1.22
Pyrene	2.42	1.46	1.20	1.20
Benzo(a)anthracene	0.53	0.28	0.24	0.25
Chrysene	0.48	0.28	0.24	0.25
Benzo(b)fluoranthene	0.28	0.17	0.14	0.13
Benzo(k)fluoranthene	0.36	0.20	0.19	0.19
Benzo(a)pyrene	0.39	0.21	0.19	0.20
Indeno(1,2,3-cd)pyrene	0.24	0.15	0.13	0.14
Dibenz(a,h)anthracene	0.046	0.027	0.020	0.020
Benzo(ghi)perylene	0.29	0.18	0.14	0.15
SUM 16-EPA PAH	30.31	18.66	15.25	14.93

Table A-19. PAH emission factors for NSB/NSL.

PAH	NSB1/NSL1	NSB2/NSL2	NSB3/NSL3	NSB4/NSL4
	mg/kg Fiberboard			
Naphthalene	6.58	29.31	24.36	23.72

Acenaphthylene	2.91	8.81	8.02	7.89
Acenaphthene	0.15	0.60	0.49	0.46
Fluorene	0.66	2.00	1.55	1.49
Phenanthrene	2.60	5.61	4.81	4.64
Anthracene	0.54	1.32	1.05	1.05
Fluoranthene	1.35	1.98	1.84	1.91
Pyrene	1.31	1.86	1.68	1.77
Benzo(a)anthracene	0.28	0.59	0.45	0.43
Chrysene	0.27	0.54	0.43	0.41
Benzo(b)fluoranthene	0.16	0.32	0.22	0.21
Benzo(k)fluoranthene	0.19	0.28	0.31	0.29
Benzo(a)pyrene	0.21	0.37	0.34	0.33
Indeno(1,2,3-cd)pyrene	0.14	0.22	0.22	0.21
Dibenz(a,h)anthracene	0.026	0.050	0.043	0.031
Benzo(ghi)perylene	0.16	0.24	0.23	0.21
SUM 16-EPA PAH	17.55	54.10	46.04	45.05

Table A-20. PAH emission factors for SB/SL.

PAH	SB1/SL1	SB2/SL2	SB3/SL3	SB4/SL4
	mg/kg Fiberboard			
Naphthalene	10.61	11.12	12.13	24.58
Acenaphthylene	3.44	3.33	4.60	7.99
Acenaphthene	0.22	0.20	0.34	0.64
Fluorene	1.16	1.09	2.04	2.74
Phenanthrene	4.21	4.23	9.31	9.55
Anthracene	0.94	0.93	2.32	2.54
Fluoranthene	1.70	1.65	3.70	3.75
Pyrene	1.56	1.47	3.29	3.48
Benzo(a)anthracene	0.45	0.45	0.98	1.11
Chrysene	0.43	0.43	0.98	1.04
Benzo(b)fluoranthene	0.21	0.19	0.44	0.50
Benzo(k)fluoranthene	0.27	0.25	0.49	0.59
Benzo(a)pyrene	0.28	0.26	0.58	0.69
Indeno(1,2,3-cd)pyrene	0.17	0.16	0.36	0.41
Dibenz(a,h)anthracene	0.036	0.034	0.091	0.11
Benzo(ghi)perylene	0.19	0.16	0.33	0.40
SUM 16-EPA PAH	25.88	25.96	41.98	60.12

Table A-21. TEQ PAH emission factors for NWS.

PAH	NWS1	NWS3	NWS4
	mg B[a]P TEQ/kg Fiberboard		
Naphthalene	NA	NA	NA

Acenaphthylene	NA	NA	NA
Acenaphthene	NA	NA	NA
Fluorene	NA	NA	NA
Phenanthrene	6.13E-03	6.69E-03	2.36E-03
Anthracene	1.61E-03	1.52E-03	4.86E-04
Fluoranthene	3.24E-01	3.22E-01	9.17E-02
Pyrene	6.10E-03	5.87E-03	1.64E-03
Benzo(a)anthracene	8.17E-03	7.36E-03	2.17E-03
Chrysene	4.40E-02	4.05E-02	1.28E-02
Benzo(b)fluoranthene	8.64E-02	7.37E-02	2.58E-02
Benzo(k)fluoranthene	5.78E-02	5.92E-02	1.92E-02
Benzo(a)pyrene	1.34E+00	1.32E+00	3.85E-01
Indeno(1,2,3-cd)pyrene	8.75E-02	8.22E-02	2.70E-02
Dibenz(a,h)anthracene	0.00E+00	1.42E-01	4.34E-02
Benzo(ghi)perylene	1.83E-02	1.93E-02	6.08E-03
SUM 16-EPA PAH	1.98E+00	2.08E+00	6.17E-01

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Table A-22. TEQ PAH emission factors for CB/CL.

PAH	mg B[a]P TEQ/kg Fiberboard			
	CB1/CL1	CB2/CL2	CB3/CL3	CB4/CL4
Naphthalene	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Phenanthrene	2.15E-03	1.41E-03	1.24E-03	1.17E-03
Anthracene	4.57E-04	2.84E-04	2.50E-04	2.31E-04
Fluoranthene	1.23E-01	7.62E-02	6.35E-02	6.10E-02
Pyrene	2.42E-03	1.46E-03	1.20E-03	1.20E-03
Benzo(a)anthracene	2.63E-03	1.40E-03	1.22E-03	1.25E-03
Chrysene	1.44E-02	8.42E-03	7.14E-03	7.49E-03
Benzo(b)fluoranthene	2.78E-02	1.70E-02	1.38E-02	1.33E-02
Benzo(k)fluoranthene	1.80E-02	9.76E-03	9.33E-03	9.41E-03
Benzo(a)pyrene	3.87E-01	2.12E-01	1.87E-01	1.95E-01
Indeno(1,2,3-cd)pyrene	2.37E-02	1.53E-02	1.26E-02	1.36E-02
Dibenz(a,h)anthracene	5.08E-02	3.01E-02	2.21E-02	2.25E-02
Benzo(ghi)perylene	5.77E-03	3.52E-03	2.90E-03	3.01E-03
SUM 16-EPA PAH	6.58E-01	3.77E-01	3.22E-01	3.30E-01

Table A-23. TEQ PAH emission factors for NSB/NSL.

PAH	mg B[a]P TEQ/kg Fiberboard			
	NSB1/NSL1	NSB2/NSL2	NSB3/NSL3	NSB4/NSL4
Naphthalene	NA	NA	NA	NA

Acenaphthylene	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Phenanthrene	1.30E-03	2.81E-03	2.40E-03	2.32E-03
Anthracene	2.70E-04	6.60E-04	5.25E-04	5.27E-04
Fluoranthene	6.73E-02	9.88E-02	9.19E-02	9.55E-02
Pyrene	1.31E-03	1.86E-03	1.68E-03	1.77E-03
Benzo(a)anthracene	1.40E-03	2.95E-03	2.26E-03	2.14E-03
Chrysene	8.12E-03	1.61E-02	1.29E-02	1.22E-02
Benzo(b)fluoranthene	1.57E-02	3.22E-02	2.25E-02	2.13E-02
Benzo(k)fluoranthene	9.31E-03	1.38E-02	1.56E-02	1.43E-02
Benzo(a)pyrene	2.14E-01	3.67E-01	3.36E-01	3.31E-01
Indeno(1,2,3-cd)pyrene	1.44E-02	2.18E-02	2.15E-02	2.08E-02
Dibenz(a,h)anthracene	0.00E+00	5.48E-02	4.71E-02	3.39E-02
Benzo(ghi)perylene	3.27E-03	4.83E-03	4.65E-03	4.14E-03
SUM 16-EPA PAH	3.37E-01	6.18E-01	5.59E-01	5.40E-01

Table A-24. TEQ PAH emission factors for SB/SL.

PAH	SB1/SL1	SB2/SL2	SB3/SL3	SB4/SL4
	mg B[a]P TEQ/kg Fiberboard			
Naphthalene	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Phenanthrene	2.11E-03	2.11E-03	4.65E-03	4.77E-03
Anthracene	4.71E-04	4.66E-04	1.16E-03	1.27E-03
Fluoranthene	8.49E-02	8.26E-02	1.85E-01	1.88E-01
Pyrene	1.56E-03	1.47E-03	3.29E-03	3.48E-03
Benzo(a)anthracene	2.25E-03	2.25E-03	4.90E-03	5.54E-03
Chrysene	1.28E-02	1.30E-02	2.93E-02	3.13E-02
Benzo(b)fluoranthene	2.10E-02	1.89E-02	4.37E-02	4.98E-02
Benzo(k)fluoranthene	1.35E-02	1.24E-02	2.45E-02	2.94E-02
Benzo(a)pyrene	2.79E-01	2.62E-01	5.85E-01	6.94E-01
Indeno(1,2,3-cd)pyrene	1.71E-02	1.63E-02	3.62E-02	4.10E-02
Dibenz(a,h)anthracene	0.00E+00	3.78E-02	9.97E-02	1.18E-01
Benzo(ghi)perylene	3.72E-03	3.29E-03	6.63E-03	8.02E-03
SUM 16-EPA PAH	4.39E-01	4.53E-01	1.02E+00	1.17E+00

845 Table A-25: PM Emission Factors.

Date	Matrix	EF PM _{2.5}	EF PM ₁₀
		g/kg Fiberboard	
11/19/2014	NSB/NSL	2.8	2.9

11/19/2014	NSB/NSL	2.7	2.8
12/11/2014	NSB/NSL	2.5	2.5
12/11/2014	NSB/NSL	8.3	7.5
12/17/2014	NSB/NSL	3.0	3.0
12/17/2014	NSB/NSL	2.7	2.8
12/17/2014	NSB/NSL	2.6	2.7
12/17/2014	NSB/NSL	2.9	3.0
11/17/2014	NWS	2.6	2.7
11/17/2014	NWS	3.5	3.9
11/17/2014	NWS	3.5	3.4
11/18/2014	NWS	3.4	3.5
11/18/2014	NWS	3.4	3.2
12/08/2014	NWS	5.1	5.1
12/09/2014	NWS	3.3	3.7
12/09/2014	NWS	2.9	3.3
12/10/2014	NWS	2.6	2.7
12/10/2014	NWS	4.1	4.2
11/20/2014	SB/SL	2.4	2.3
11/20/2014	SB/SL	2.0	1.9
11/21/2014	SB/SL	2.9	2.4
11/21/2014	SB/SL	1.9	2.0
12/03/2014	SB/SL	4.4	4.5
12/04/2014	SB/SL	2.9	2.9
12/04/2014	SB/SL	3.2	3.0
11/18/2014	CB/CL	3.1	3.1
11/18/2014	CB/CL	3.0	3.0
11/19/2014	CB/CL	3.4	3.5
11/19/2014	CB/CL	3.3	3.4
11/20/2014	CB/CL	2.7	2.7
11/20/2014	CB/CL	3.1	3.4
11/21/2014	CB/CL	3.1	3.1
11/21/2014	CB/CL	1.4	1.3

Table A-26. VOC emission factors from current fiberboard Solid Boxes and Liners (CB/CL).

	Current Fiberboard Solid Box and Liner (CB/CL)			
	1	2	3	4

Compound	Method detection limit							
	EF mg/kg	EF mg/kg						
Propene	100.64	0.18	19.63	0.11	16.20	0.09	16.70	0.06
Dichlorodifluoromethane (CFC-12)	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Chloromethane	4.49	0.19	2.76	0.11	1.31	0.09	1.45	0.07
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.24	ND	0.14	ND	0.12	ND	0.09
Vinyl Chloride	0.22	0.22	ND	0.13	ND	0.11	ND	0.08
1,3-Butadiene	52.33	0.28	10.10	0.17	8.10	0.14	5.77	0.10
Bromomethane	ND	0.24	ND	0.14	ND	0.12	ND	0.09
Chloroethane	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Ethanol	5.94	1.01	1.10	0.61	1.02	0.51	0.38	0.36
Acetonitrile	2.82	0.23	0.78	0.14	0.58	0.11	0.56	0.08
Acrolein	3.02	0.22	8.37	0.13	12.72	0.11	13.51	0.08
Acetone	83.43	1.00	13.25	0.58	ND	0.49	8.34	0.35
Trichlorofluoromethane	ND	0.22	ND	0.13	ND	0.11	ND	0.08
2-Propanol (Isopropyl Alcohol)	ND	0.54	ND	0.32	ND	0.25	ND	0.18
Acrylonitrile	1.31	0.22	0.35	0.13	0.28	0.11	0.24	0.08
1,1-Dichloroethene	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Methylene Chloride	11.78	0.22	7.71	0.13	2.24	0.11	0.14	0.08
3-Chloro-1-propene (Allyl Chloride)	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Trichlorotrifluoroethane	0.01	0.22	ND	0.13	ND	0.11	ND	0.08
Carbon Disulfide	2.42	0.19	0.84	0.11	1.25	0.09	1.21	0.07
trans-1,2-Dichloroethene	ND	0.24	ND	0.14	ND	0.12	ND	0.09
1,1-Dichloroethane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Methyl tert-Butyl Ether	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Vinyl Acetate	41.26	0.84	46.18	0.49	21.29	0.42	22.77	0.29
2-Butanone (MEK)	26.07	0.27	5.17	0.16	2.98	0.13	2.87	0.09
cis-1,2-Dichloroethene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Ethyl Acetate	ND	0.45	ND	0.27	ND	0.22	0.09	0.15
n-Hexane	0.26	0.19	0.05	0.11	0.04	0.09	0.07	0.07
Chloroform	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Tetrahydrofuran (THF)	1.11	0.26	ND	0.15	ND	0.12	0.10	0.09
1,2-Dichloroethane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
1,1,1-Trichloroethane	ND	0.22	ND	0.13	ND	0.11	ND	0.08
Benzene	190.89	2.01	51.86	0.12	41.57	0.10	33.35	0.07
Carbon Tetrachloride	0.02	0.19	0.01	0.11	0.01	0.09	0.01	0.07
Cyclohexane	ND	0.37	ND	0.22	ND	0.18	ND	0.13
1,2-Dichloropropane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Bromodichloromethane	ND	0.19	ND	0.11	ND	0.09	ND	0.07

Trichloroethene	ND	0.18	ND	0.11	ND	0.09	ND	0.06
1,4-Dioxane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Methyl Methacrylate	ND	0.40	ND	0.23	ND	0.19	ND	0.14
<i>n</i> -Heptane	ND	0.22	ND	0.13	ND	0.11	ND	0.08
cis-1,3-Dichloropropene	ND	0.18	ND	0.11	ND	0.09	ND	0.06
4-Methyl-2-pentanone	ND	0.20	ND	0.12	ND	0.10	ND	0.07
trans-1,3-Dichloropropene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
1,1,2-Trichloroethane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Toluene	47.77	0.22	10.81	0.13	9.36	0.11	7.21	0.08
2-Hexanone	0.37	0.20	0.14	0.12	ND	0.10	0.08	0.07
Dibromochloromethane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
1,2-Dibromoethane	ND	0.20	ND	0.12	ND	0.10	ND	0.07
<i>n</i> -Butyl Acetate	ND	0.20	ND	0.12	ND	0.10	ND	0.07
<i>n</i> -Octane	ND	0.23	ND	0.14	ND	0.11	ND	0.08
Tetrachloroethene	ND	0.18	ND	0.11	ND	0.09	ND	0.06
Chlorobenzene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Ethylbenzene	5.74	0.20	1.53	0.12	1.34	0.10	1.02	0.07
<i>m</i> -, <i>p</i> -Xylenes	4.43	0.38	1.33	0.23	1.11	0.19	0.88	0.13
Bromoform	ND	0.19	ND	0.11	ND	0.09	ND	0.07
Styrene	9.16	0.19	5.48	0.11	4.40	0.09	3.49	0.07
<i>o</i> -Xylene	1.61	0.19	0.52	0.11	0.46	0.09	0.36	0.07
<i>n</i> -Nonane	ND	0.19	ND	0.11	ND	0.09	ND	0.07
1,1,2,2-Tetrachloroethane	ND	0.19	ND	0.11	ND	0.09	ND	0.07
Cumene	0.33	0.19	ND	0.11	ND	0.09	ND	0.07
alpha-Pinene	0.51	0.18	0.21	0.11	0.28	0.09	0.08	0.06
<i>n</i> -Propylbenzene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
4-Ethyltoluene	ND	0.20	0.12	0.12	0.10	0.10	0.09	0.07
1,3,5-Trimethylbenzene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
1,2,4-Trimethylbenzene	ND	0.19	0.16	0.11	0.14	0.09	0.12	0.07
Benzyl Chloride	ND	0.14	ND	0.08	ND	0.07	ND	0.05
1,3-Dichlorobenzene	ND	0.19	ND	0.11	ND	0.09	ND	0.07
1,4-Dichlorobenzene	ND	0.18	ND	0.11	ND	0.09	ND	0.06
1,2-Dichlorobenzene	ND	0.19	ND	0.11	ND	0.09	ND	0.07
d-Limonene	ND	0.18	0.18	0.11	0.14	0.09	0.10	0.06
1,2-Dibromo-3-chloropropane	ND	0.13	ND	0.08	ND	0.06	ND	0.04
1,2,4-Trichlorobenzene	ND	0.20	ND	0.12	ND	0.10	ND	0.07
Naphthalene	0.42	0.23	12.99	0.14	10.64	0.11	11.39	0.08
Hexachlorobutadiene	ND	0.18	ND	0.11	ND	0.09	ND	0.06
g/kg cardboard								
Carbon Monoxide	27.72		15.57		14.07		14.29	
Methane	0.20		0.17		0.20		0.13	

Carbon Dioxide	1651.55	1670.72	1673.00	1672.84
MCE	0.974	0.986	0.987	0.987

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875 Table A-27. VOC emission factors from corrugated Spectra-kote polymer fiberboard box and liner (SB/SL).

	Corrugated Spectra-kote Polymer Fiberboard box and liner (SB/SL)
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Compound	1		2		3		4	
	Method detection limit		Method detection limit		Method detection limit		Method detection limit	
	EF mg/kg	EF mg/kg						
Propene	38.07	0.11	47.18	0.11	152.04	0.40	236.40	0.42
Dichlorodifluoromethane (CFC-12)	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Chloromethane	2.47	0.11	2.99	0.12	10.49	0.43	6.55	0.46
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.14	ND	0.15	ND	0.52	ND	0.56
Vinyl Chloride	ND	0.13	ND	0.14	ND	0.46	ND	0.53
1,3-Butadiene	5.87	0.16	10.67	0.17	65.98	0.60	95.26	0.67
Bromomethane	ND	0.14	ND	0.15	ND	0.52	ND	0.56
Chloroethane	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Ethanol	ND	0.60	0.37	0.64	6.20	2.21	ND	2.43
Acetonitrile	1.16	0.14	1.42	0.14	4.02	0.49	5.29	0.56
Acrolein	25.38	0.13	26.67	0.14	134.83	0.46	137.60	0.53
Acetone	ND	0.59	ND	0.62	ND	2.12	ND	2.36
Trichlorofluoromethane	ND	0.13	ND	0.14	ND	0.46	ND	0.53
2-Propanol (Isopropyl Alcohol)	ND	0.32	ND	0.33	ND	1.18	ND	1.27
Acrylonitrile	0.57	0.13	0.64	0.14	2.15	0.46	2.61	0.53
1,1-Dichloroethene	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Methylene Chloride	4.24	0.13	0.08	0.14	ND	0.46	ND	0.53
3-Chloro-1-propene (Allyl Chloride)	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Trichlorotrifluoroethane	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Carbon Disulfide	0.35	0.11	0.35	0.12	2.29	0.43	1.48	0.46
trans-1,2-Dichloroethene	ND	0.14	ND	0.15	ND	0.52	ND	0.56
1,1-Dichloroethane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Methyl tert-Butyl Ether	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Vinyl Acetate	36.48	0.49	51.29	0.51	189.34	1.81	116.43	1.98
2-Butanone (MEK)	5.38	0.16	7.36	0.17	36.98	0.57	41.95	0.64
cis-1,2-Dichloroethene	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Ethyl Acetate	ND	0.27	0.57	0.29	ND	0.98	ND	1.06
<i>n</i> -Hexane	0.16	0.11	0.23	0.12	0.36	0.43	ND	0.46
Chloroform	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Tetrahydrofuran (THF)	0.19	0.15	0.16	0.16	1.35	0.55	1.09	0.60
1,2-Dichloroethane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
1,1,1-Trichloroethane	ND	0.13	ND	0.14	ND	0.46	ND	0.53
Benzene	60.23	0.12	71.73	0.13	220.80	0.43	260.98	0.49
Carbon Tetrachloride	ND	0.11	ND	0.12	ND	0.43	ND	0.46
Cyclohexane	ND	0.22	ND	0.23	ND	0.80	ND	0.88
1,2-Dichloropropane	ND	0.12	ND	0.13	ND	0.43	ND	0.49

Bromodichloromethane	ND	0.11	ND	0.12	ND	0.43	ND	0.46
Trichloroethene	ND	0.11	ND	0.11	ND	0.40	ND	0.42
1,4-Dioxane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Methyl Methacrylate	4.92	0.24	6.77	0.25	31.56	0.86	23.99	0.95
<i>n</i> -Heptane	ND	0.13	0.18	0.14	ND	0.46	ND	0.53
cis-1,3-Dichloropropene	ND	0.11	ND	0.11	ND	0.40	ND	0.42
4-Methyl-2-pentanone	ND	0.12	ND	0.13	ND	0.43	ND	0.49
trans-1,3-Dichloropropene	ND	0.12	ND	0.13	ND	0.43	ND	0.49
1,1,2-Trichloroethane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Toluene	17.36	0.13	22.46	0.14	77.30	0.46	109.19	0.53
2-Hexanone	ND	0.12	0.18	0.13	0.72	0.43	0.64	0.49
Dibromochloromethane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
1,2-Dibromoethane	ND	0.12	ND	0.13	ND	0.43	ND	0.49
<i>n</i> -Butyl Acetate	ND	0.12	ND	0.13	ND	0.43	ND	0.49
<i>n</i> -Octane	ND	0.14	ND	0.14	ND	0.49	ND	0.56
Tetrachloroethene	ND	0.11	ND	0.11	0.66	0.40	ND	0.42
Chlorobenzene	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Ethylbenzene	3.49	0.12	4.72	0.13	21.23	0.43	30.34	0.49
<i>m</i> -,, <i>p</i> -Xylenes	1.90	0.22	2.46	0.25	8.61	0.83	14.82	0.92
Bromoform	ND	0.11	ND	0.12	ND	0.43	ND	0.46
Styrene	19.04	0.11	30.77	0.12	34.42	0.43	155.25	0.46
<i>o</i> -Xylene	0.81	0.11	1.07	0.12	3.44	0.43	6.35	0.46
<i>n</i> -Nonane	ND	0.11	ND	0.12	ND	0.43	ND	0.46
1,1,2,2-Tetrachloroethane	ND	0.11	ND	0.12	ND	0.43	ND	0.46
Cumene	0.33	0.11	0.45	0.12	2.12	0.43	3.25	0.46
alpha-Pinene	0.22	0.11	0.11	0.11	0.48	0.40	0.49	0.42
<i>n</i> -Propylbenzene	0.17	0.12	0.23	0.13	0.89	0.43	1.55	0.49
4-Ethyltoluene	0.15	0.12	0.19	0.13	0.55	0.43	1.23	0.49
1,3,5-Trimethylbenzene	ND	0.12	0.14	0.13	ND	0.43	0.88	0.49
1,2,4-Trimethylbenzene	0.24	0.11	0.35	0.12	0.55	0.43	2.26	0.46
Benzyl Chloride	ND	0.08	ND	0.09	ND	0.32	ND	0.34
1,3-Dichlorobenzene	ND	0.11	ND	0.12	ND	0.43	ND	0.46
1,4-Dichlorobenzene	ND	0.11	ND	0.11	ND	0.40	ND	0.42
1,2-Dichlorobenzene	ND	0.11	ND	0.12	ND	0.43	ND	0.46
d-Limonene	ND	0.11	ND	0.11	ND	0.40	0.42	0.42
1,2-Dibromo-3-chloropropane	ND	0.07	ND	0.08	ND	0.28	ND	0.30
1,2,4-Trichlorobenzene	ND	0.12	ND	0.13	ND	0.43	ND	0.49
Naphthalene	20.62	0.14	22.57	0.14	1.29	0.49	56.45	0.56
Hexachlorobutadiene	ND	0.11	ND	0.11	ND	0.40	ND	0.42
g/kg paperboard								
Carbon Monoxide	15.11		16.24		29.30		36.04	
Methane	0.28		0.34		1.09		1.55	

Carbon Dioxide	1633.37	1631.43	1608.84	1596.99
MCE	0.986	0.985	0.972	0.966

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Table A-28. VOC emission factors from No-Spectra-kote fiberboard box and liner (NSB/NSL).

	No-Spectra-kote box and liner (NSB/NSL)			
	1	2	3	4

Compound	Method detection limit							
	EF mg/kg	EF mg/kg						
Propene	19.06	0.07	113.86	0.19	56.54	0.13	146.60	0.31
Dichlorodifluoromethane (CFC 12)	ND	0.08	0.05	0.24	0.03	0.16	ND	0.35
Chloromethane	0.97	0.07	2.21	0.21	1.50	0.14	2.53	0.33
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.09	ND	0.26	ND	0.19	ND	0.39
Vinyl Chloride	ND	0.08	ND	0.24	ND	0.16	ND	0.35
1,3-Butadiene	8.85	0.10	42.37	0.32	23.98	0.21	61.26	0.46
Bromomethane	ND	0.09	ND	0.26	ND	0.19	ND	0.39
Chloroethane	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Ethanol	1.02	0.37	8.10	1.11	ND	0.75	5.82	1.68
Acetonitrile	0.53	0.08	2.12	0.25	1.32	0.17	2.41	0.37
Acrolein	1.36	0.08	116.51	0.24	54.82	0.16	131.28	0.35
Acetone	ND	0.35	ND	1.06	ND	0.74	127.98	1.62
Trichlorofluoromethane	ND	0.08	0.03	0.24	ND	0.16	ND	0.35
2-Propanol (Isopropyl Alcohol)	ND	0.19	ND	0.58	ND	0.39	ND	0.90
Acrylonitrile	0.19	0.08	0.64	0.24	0.46	0.16	0.90	0.35
1,1-Dichloroethene	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Methylene Chloride	0.23	0.08	4.16	0.24	7.49	0.16	0.48	0.35
3-Chloro-1-propene (Allyl Chloride)	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Trichlorotrifluoroethane	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Carbon Disulfide	0.29	0.07	0.42	0.21	2.91	0.14	0.66	0.33
trans-1,2-Dichloroethene	ND	0.09	ND	0.26	ND	0.19	ND	0.39
1,1-Dichloroethane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Methyl tert-Butyl Ether	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Vinyl Acetate	50.37	0.30	ND	0.90	ND	0.62	ND	1.38
2-Butanone (MEK)	6.25	0.10	34.13	0.29	16.09	0.21	41.33	0.44
cis-1,2-Dichloroethene	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Ethyl Acetate	ND	0.16	2.30	0.48	ND	0.33	ND	0.74
n-Hexane	0.04	0.07	1.97	0.21	0.32	0.14	0.38	0.33
Chloroform	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Tetrahydrofuran (THF)	0.12	0.09	1.14	0.26	0.38	0.19	1.20	0.42
1,2-Dichloroethane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
1,1,1-Trichloroethane	ND	0.08	ND	0.24	ND	0.16	ND	0.35
Benzene	33.99	0.07	100.53	0.22	78.75	0.15	150.90	0.33
Carbon Tetrachloride	ND	0.07	ND	0.21	ND	0.14	ND	0.33
Cyclohexane	ND	0.13	ND	0.40	ND	0.27	ND	0.61
1,2-Dichloropropane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Bromodichloromethane	ND	0.07	ND	0.21	ND	0.14	ND	0.33

Trichloroethene	ND	0.07	ND	0.19	ND	0.13	ND	0.31
1,4-Dioxane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Methyl Methacrylate	ND	0.15	0.50	0.42	ND	0.29	ND	0.66
<i>n</i> -Heptane	ND	0.08	0.64	0.24	ND	0.16	ND	0.35
cis-1,3-Dichloropropene	ND	0.07	ND	0.19	ND	0.13	ND	0.31
4-Methyl-2-pentanone	ND	0.07	0.34	0.22	ND	0.15	ND	0.33
trans-1,3-Dichloropropene	ND	0.07	ND	0.22	ND	0.15	ND	0.33
1,1,2-Trichloroethane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Toluene	8.37	0.08	36.93	0.24	22.18	0.16	45.83	0.35
2-Hexanone	0.10	0.07	0.42	0.22	0.33	0.15	0.59	0.33
Dibromochloromethane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
1,2-Dibromoethane	ND	0.07	ND	0.22	ND	0.15	ND	0.33
<i>n</i> -Butyl Acetate	ND	0.07	ND	0.22	ND	0.15	ND	0.33
<i>n</i> -Octane	ND	0.08	0.45	0.25	ND	0.17	ND	0.37
Tetrachloroethene	ND	0.07	ND	0.19	ND	0.13	ND	0.31
Chlorobenzene	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Ethylbenzene	1.24	0.07	5.83	0.22	3.43	0.15	7.88	0.33
<i>m</i> , <i>p</i> -Xylenes	1.24	0.14	7.68	0.42	4.28	0.29	8.97	0.63
Bromoform	ND	0.07	ND	0.21	ND	0.14	ND	0.33
Styrene	4.22	0.07	15.36	0.21	10.11	0.14	21.88	0.33
<i>o</i> -Xylene	0.52	0.07	2.91	0.21	1.71	0.14	3.72	0.33
<i>n</i> -Nonane	ND	0.07	ND	0.21	ND	0.14	ND	0.33
1,1,2,2-Tetrachloroethane	ND	0.07	ND	0.21	ND	0.14	ND	0.33
Cumene	ND	0.07	0.29	0.21	0.17	0.14	0.42	0.33
alpha-Pinene	0.15	0.07	0.37	0.19	0.39	0.13	0.57	0.31
<i>n</i> -Propylbenzene	ND	0.07	0.34	0.22	0.21	0.15	0.39	0.33
4-Ethyltoluene	0.12	0.07	0.69	0.22	0.36	0.15	0.79	0.33
1,3,5-Trimethylbenzene	ND	0.07	0.40	0.22	0.22	0.15	0.44	0.33
1,2,4-Trimethylbenzene	0.18	0.07	1.30	0.21	0.74	0.14	1.40	0.33
Benzyl Chloride	ND	0.05	ND	0.15	ND	0.10	ND	0.24
1,3-Dichlorobenzene	ND	0.07	ND	0.21	ND	0.14	ND	0.33
1,4-Dichlorobenzene	ND	0.07	ND	0.19	ND	0.13	ND	0.31
1,2-Dichlorobenzene	ND	0.07	ND	0.21	ND	0.14	ND	0.33
d-Limonene	0.13	0.07	0.48	0.19	0.27	0.13	0.33	0.31
1,2-Dibromo-3-chloropropane	ND	0.05	ND	0.14	ND	0.09	ND	0.21
1,2,4-Trichlorobenzene	ND	0.07	ND	0.22	ND	0.15	ND	0.33
Naphthalene	9.80	0.08	14.56	0.25	18.85	0.17	37.20	0.37
Hexachlorobutadiene	ND	0.07	ND	0.19	ND	0.13	ND	0.31
g/kg paperboard								
Carbon Monoxide	15.62		26.44		19.27		30.13	
Methane	0.17		0.87		0.53		1.16	

Carbon Dioxide	1647.17	1628.25	1640.46	1621.64
MCE	0.985	0.975	0.982	0.972

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Table A-29. VOC emission factors from current fiberboard box, no wet strength (NWS).

	Current Fiberboard box, no wet strength (NWS)			
	1	2	3	4

	Method detection limit		Method detection limit		Method detection limit		Method detection limit	
	EF mg/kg	EF mg/kg						
Propene	62.97	0.18	44.62	0.18	52.42	0.17	42.07	0.13
Dichlorodifluoromethane (CFC-12)	ND	0.22	ND	0.22	0.02	0.21	ND	0.16
Chloromethane	0.71	0.20	0.73	0.20	0.51	0.19	0.55	0.14
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.25	ND	0.25	ND	0.24	ND	0.18
Vinyl Chloride	ND	0.22	ND	0.22	ND	0.21	ND	0.16
1,3-Butadiene	31.48	0.29	21.72	0.29	23.83	0.29	19.28	0.21
Bromomethane	ND	0.25	ND	0.25	ND	0.24	ND	0.18
Chloroethane	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Ethanol	2.76	1.07	ND	1.04	ND	1.00	ND	0.77
Acetonitrile	0.73	0.24	0.68	0.24	0.52	0.22	0.56	0.17
Acrolein	31.97	0.22	44.62	0.22	33.36	0.21	33.31	0.16
Acetone	41.12	1.02	ND	1.01	ND	0.95	ND	0.74
Trichlorofluoromethane	ND	0.22	ND	0.22	0.02	0.21	ND	0.16
2-Propanol (Isopropyl Alcohol)	ND	0.53	ND	0.54	ND	0.52	ND	0.40
Acrylonitrile	ND	0.22	0.36	0.22	0.24	0.21	0.23	0.16
1,1-Dichloroethene	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Methylene Chloride	12.93	0.22	7.94	0.22	0.24	0.21	5.56	0.16
3-Chloro-1-propene (Allyl Chloride)	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Trichlorotrifluoroethane	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Carbon Disulfide	2.66	0.20	1.99	0.20	1.41	0.19	0.96	0.14
trans-1,2-Dichloroethene	ND	0.25	ND	0.25	ND	0.24	ND	0.18
1,1-Dichloroethane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Methyl tert-Butyl Ether	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Vinyl Acetate	58.13	0.87	38.67	0.83	ND	0.81	ND	0.63
2-Butanone (MEK)	14.00	0.28	8.89	0.27	7.36	0.26	8.05	0.21
cis-1,2-Dichloroethene	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Ethyl Acetate	ND	0.46	ND	0.45	1.00	0.43	ND	0.33
n-Hexane	0.22	0.20	0.14	0.20	0.61	0.19	0.43	0.14
Chloroform	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Tetrahydrofuran (THF)	0.73	0.26	0.42	0.26	0.33	0.24	0.30	0.19
1,2-Dichloroethane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
1,1,1-Trichloroethane	ND	0.22	ND	0.22	ND	0.21	ND	0.16
Benzene	125.78	0.21	121.87	0.21	102.37	0.20	92.86	0.15
Carbon Tetrachloride	0.01	0.20	ND	0.20	ND	0.19	ND	0.14
Cyclohexane	ND	0.38	ND	0.39	ND	0.36	ND	0.28
1,2-Dichloropropane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Bromodichloromethane	ND	0.20	ND	0.20	ND	0.19	ND	0.14

Trichloroethene	ND	0.18	ND	0.18	ND	0.17	ND	0.13
1,4-Dioxane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Methyl Methacrylate	ND	0.41	ND	0.42	ND	0.38	ND	0.30
<i>n</i> -Heptane	ND	0.22	ND	0.22	ND	0.21	ND	0.16
cis-1,3-Dichloropropene	ND	0.18	ND	0.18	ND	0.17	ND	0.13
4-Methyl-2-pentanone	ND	0.21	ND	0.21	ND	0.20	ND	0.15
trans-1,3-Dichloropropene	ND	0.21	ND	0.21	ND	0.20	ND	0.15
1,1,2-Trichloroethane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Toluene	32.19	0.22	26.32	0.22	26.08	0.21	20.94	0.16
2-Hexanone	0.31	0.21	0.23	0.21	ND	0.20	ND	0.15
Dibromochloromethane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
1,2-Dibromoethane	ND	0.21	ND	0.21	ND	0.20	ND	0.15
<i>n</i> -Butyl Acetate	ND	0.21	ND	0.21	ND	0.20	ND	0.15
<i>n</i> -Octane	ND	0.24	ND	0.24	ND	0.22	ND	0.17
Tetrachloroethene	ND	0.18	ND	0.18	ND	0.17	ND	0.13
Chlorobenzene	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Ethylbenzene	4.75	0.21	3.87	0.21	4.29	0.20	3.33	0.15
<i>m</i> , <i>p</i> -Xylenes	4.84	0.39	3.27	0.39	3.81	0.38	2.98	0.28
Bromoform	ND	0.20	ND	0.20	ND	0.19	ND	0.14
Styrene	15.02	0.20	13.09	0.20	13.34	0.19	11.04	0.14
<i>o</i> -Xylene	1.94	0.20	1.34	0.20	1.52	0.19	1.21	0.14
<i>n</i> -Nonane	ND	0.20	ND	0.20	ND	0.19	ND	0.14
1,1,2,2-Tetrachloroethane	ND	0.20	ND	0.20	ND	0.19	ND	0.14
Cumene	0.23	0.20	0.21	0.20	0.19	0.19	0.17	0.14
alpha-Pinene	2.42	0.18	0.38	0.18	0.15	0.17	0.40	0.13
<i>n</i> -Propylbenzene	ND	0.21	ND	0.21	ND	0.20	ND	0.15
4-Ethyltoluene	0.46	0.21	0.33	0.21	0.38	0.20	0.26	0.15
1,3,5-Trimethylbenzene	0.23	0.21	ND	0.21	ND	0.20	ND	0.15
1,2,4-Trimethylbenzene	0.73	0.20	0.42	0.20	0.57	0.19	0.40	0.14
Benzyl Chloride	ND	0.15	ND	0.14	ND	0.14	ND	0.11
1,3-Dichlorobenzene	ND	0.20	ND	0.20	ND	0.19	ND	0.14
1,4-Dichlorobenzene	ND	0.18	ND	0.18	ND	0.17	ND	0.13
1,2-Dichlorobenzene	ND	0.20	ND	0.20	ND	0.19	ND	0.14
d-Limonene	2.13	0.18	0.39	0.18	0.33	0.17	0.30	0.13
1,2-Dibromo-3-chloropropane	ND	0.13	ND	0.13	ND	0.12	ND	0.09
1,2,4-Trichlorobenzene	ND	0.21	ND	0.21	ND	0.20	ND	0.15
Naphthalene	36.33	0.24	35.70	0.24	30.97	0.22	31.56	0.17
Hexachlorobutadiene	ND	0.18	ND	0.18	ND	0.17	ND	0.13
g/kg paperboard								
Carbon Monoxide	23.90		23.90		16.68		17.50	
Methane	0.48		0.47		0.39		0.38	

Carbon Dioxide	1668.33	1668.36	1679.92	1678.65
MCE	0.978	0.978	0.985	0.984

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Appendix B: Data for each sample collected from OB of MRE pouches.

Table B-1. PCDD/PCDF data for 0 % NEW 01.

Sample ID	PS-100OLD-073015-01	MCE	0.941667	Page 1 (2)
Sampling volume (m ³)	122.3			
Carbon sampled (g)	68.4			
Carbon sampled (mg/m ³)	559.6			
Carbon fraction	0.4			

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample	TEQ ND = 0	Total ng/m ³	TEQ ng/m ³	TEQ ND = 0
				ND = LOD			ND = LOD
2,3,7,8 - TCDD	1.02E-02		1.02E-02	1.02E-02	8.34E-05	8.34E-05	8.34E-05
1,2,3,7,8 - PeCDD	1.92E-02		1.92E-02	1.92E-02	1.57E-04	1.57E-04	1.57E-04
1,2,3,4,7,8 - HxCDD	1.26E-02		1.26E-03	1.26E-03	1.03E-04	1.03E-05	1.03E-05
1,2,3,6,7,8 - HxCDD	ND	1.37E-02	0.00E+00	1.37E-03	ND	0.00E+00	1.12E-05
1,2,3,7,8,9 - HxCDD	ND	1.45E-02	0.00E+00	1.45E-03	ND	0.00E+00	1.18E-05
1,2,3,4,6,7,8 - HpCDD	1.95E-01		1.95E-03	1.95E-03	1.59E-03	1.59E-05	1.59E-05
1,2,3,4,6,7,8,9 - OCDD	5.48E-01		1.64E-04	1.64E-04	4.48E-03	1.34E-06	1.34E-06
2,3,7,8 - TCDF	6.10E-01		6.10E-02	6.10E-02	4.98E-03	4.98E-04	4.98E-04
1,2,3,7,8 - PeCDF	1.52E-01		4.55E-03	4.55E-03	1.24E-03	3.72E-05	3.72E-05
2,3,4,7,8 - PeCDF	1.48E-01		4.45E-02	4.45E-02	1.21E-03	3.64E-04	3.64E-04
1,2,3,4,7,8 - HxCDF	5.28E-02		5.28E-03	5.28E-03	4.32E-04	4.32E-05	4.32E-05
1,2,3,6,7,8 - HxCDF	4.20E-02		4.20E-03	4.20E-03	3.43E-04	3.43E-05	3.43E-05
1,2,3,7,8,9 - HxCDF	ND	1.66E-02	0.00E+00	1.66E-03	ND	0.00E+00	1.36E-05
2,3,4,6,7,8 - HxCDF	3.44E-02		3.44E-03	3.44E-03	2.81E-04	2.81E-05	2.81E-05
1,2,3,4,6,7,8 - HpCDF	5.26E-02		5.26E-04	5.26E-04	4.30E-04	4.30E-06	4.30E-06
1,2,3,4,7,8,9 - HpCDF	ND	2.27E-02	0.00E+00	2.27E-04	ND	0.00E+00	1.86E-06
1,2,3,4,6,7,8,9 - OCDF	4.28E-02		1.28E-05	1.28E-05	3.50E-04	1.05E-07	1.05E-07
TeCDD Total	2.10E-01				1.72E-03		
PeCDD Total	1.39E-01				1.14E-03		
HxCDD Total	1.56E-01				1.27E-03		
HpCDD Total	3.46E-01				2.83E-03		
OCDD	5.48E-01				4.48E-03		
TeCDF Total	8.34E+00				6.82E-02		
PeCDF Total	1.37E+00				1.12E-02		
HxCDF Total	2.73E-01				2.23E-03		
HpCDF Total	5.26E-02				4.30E-04		
OCDF	4.78E-02				3.91E-04		
PCDD Total	1.40E+00				1.14E-02		
PCDF Total	1.01E+01				8.24E-02		
PCDD/PCDF Total	1.15E+01				9.39E-02		
PCDD TEQ Total		3.28E-02	3.56E-02			2.68E-04	2.91E-04
PCDF TEQ Total		1.23E-01	1.25E-01			1.01E-03	1.03E-03
PCDD/PCDF TEQ Total		1.56E-01	1.61E-01			1.28E-03	1.32E-03

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Isomer.	EF Total	EF TEQ ng/g Carbon ND = 0	EF TEQ ND = LOD	EF Total	EF TEQ ng/kg fuel ND = 0	EF TEQ ND = LOD
2,3,7,8 - TCDD	1.49E-04	1.49E-04	1.49E-04	6.27E-02	6.27E-02	6.27E-02
1,2,3,7,8 - PeCDD	2.81E-04	2.81E-04	2.81E-04	1.18E-01	1.18E-01	1.18E-01
1,2,3,4,7,8 - HxCDD	1.84E-04	1.84E-05	1.84E-05	7.75E-02	7.75E-03	7.75E-03
1,2,3,6,7,8 - HxCDD	ND	0.00E+00	2.00E-05	ND	0.00E+00	8.43E-03
1,2,3,7,8,9 - HxCDD	ND	0.00E+00	2.11E-05	ND	0.00E+00	8.89E-03
1,2,3,4,6,7,8 - HpCDD	2.85E-03	2.85E-05	2.85E-05	1.20E+00	1.20E-02	1.20E-02
1,2,3,4,6,7,8,9 - OCDD	8.01E-03	2.40E-06	2.40E-06	3.37E+00	1.01E-03	1.01E-03
2,3,7,8 - TCDF	8.91E-03	8.91E-04	8.91E-04	3.75E+00	3.75E-01	3.75E-01
1,2,3,7,8 - PeCDF	2.22E-03	6.65E-05	6.65E-05	9.32E-01	2.80E-02	2.80E-02
2,3,4,7,8 - PeCDF	2.17E-03	6.50E-04	6.50E-04	9.13E-01	2.74E-01	2.74E-01
1,2,3,4,7,8 - HxCDF	7.71E-04	7.71E-05	7.71E-05	3.25E-01	3.25E-02	3.25E-02
1,2,3,6,7,8 - HxCDF	6.14E-04	6.14E-05	6.14E-05	2.58E-01	2.58E-02	2.58E-02
1,2,3,7,8,9 - HxCDF	ND	0.00E+00	2.43E-05	ND	0.00E+00	1.02E-02
2,3,4,6,7,8 - HxCDF	5.03E-04	5.03E-05	5.03E-05	2.12E-01	2.12E-02	2.12E-02
1,2,3,4,6,7,8 - HpCDF	7.69E-04	7.69E-06	7.69E-06	3.24E-01	3.24E-03	3.24E-03
1,2,3,4,7,8,9 - HpCDF	ND	0.00E+00	3.32E-06	ND	0.00E+00	1.40E-03
1,2,3,4,6,7,8,9 - OCDF	6.25E-04	1.88E-07	1.88E-07	2.63E-01	7.90E-05	7.90E-05
TeCDD Total	3.07E-03			1.29E+00		
PeCDD Total	2.03E-03			8.56E-01		
HxCDD Total	2.27E-03			9.57E-01		
HpCDD Total	5.06E-03			2.13E+00		
OCDD	8.01E-03			3.37E+00		
TeCDF Total	1.22E-01			5.13E+01		
PeCDF Total	2.00E-02			8.43E+00		
HxCDF Total	3.99E-03			1.68E+00		
HpCDF Total	7.69E-04			3.24E-01		
OCDF	6.98E-04			2.94E-01		
PCDD Total	2.04E-02			8.61E+00		
PCDF Total	1.47E-01			6.20E+01		
PCDD/PCDF Total	1.68E-01			7.06E+01		
PCDD TEQ Total		4.79E-04	5.20E-04		2.02E-01	2.19E-01
PCDF TEQ Total		1.80E-03	1.83E-03		7.59E-01	7.71E-01
PCDD/PCDF TEQ Total		2.28E-03	2.35E-03		9.61E-01	9.90E-01

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Table B-2. PCDD/PCDF data for 0 % NEW 02.

Sample ID PS-100OLD2-073015-02
 MCE 0.943944
 Sampling volume (m³) 101.2
 Carbon sampled (g) 58.8
 Carbon sampled (mg/m³) 581.2
 Carbon fraction 0.4

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m ³	TEQ ng/m ³ ND = 0	TEQ ng/m ³ ND = LOD
2,3,7,8 - TCDD	3.94E-02		3.94E-02	3.94E-02	3.90E-04	3.90E-04	3.90E-04
1,2,3,7,8 - PeCDD	1.66E-02		1.66E-02	1.66E-02	1.64E-04	1.64E-04	1.64E-04
1,2,3,4,7,8 - HxCDD	5.40E-03		5.40E-04	5.40E-04	5.34E-05	5.34E-06	5.34E-06
1,2,3,6,7,8 - HxCDD	1.62E-02		1.62E-03	1.62E-03	1.60E-04	1.60E-05	1.60E-05
1,2,3,7,8,9 - HxCDD	1.38E-02		1.38E-03	1.38E-03	1.36E-04	1.36E-05	1.36E-05
1,2,3,4,6,7,8 - HpCDD	1.69E-01		1.69E-03	1.69E-03	1.67E-03	1.67E-05	1.67E-05
1,2,3,4,6,7,8,9 - OCDD	4.99E-01		1.50E-04	1.50E-04	4.94E-03	1.48E-06	1.48E-06
2,3,7,8 - TCDF	7.86E-01		7.86E-02	7.86E-02	7.77E-03	7.77E-04	7.77E-04
1,2,3,7,8 - PeCDF	1.63E-01		4.90E-03	4.90E-03	1.62E-03	4.85E-05	4.85E-05
2,3,4,7,8 - PeCDF	1.63E-01		4.88E-02	4.88E-02	1.61E-03	4.82E-04	4.82E-04
1,2,3,4,7,8 - HxCDF	4.00E-02		4.00E-03	4.00E-03	3.95E-04	3.95E-05	3.95E-05
1,2,3,6,7,8 - HxCDF	3.56E-02		3.56E-03	3.56E-03	3.52E-04	3.52E-05	3.52E-05
1,2,3,7,8,9 - HxCDF	1.62E-02		1.62E-03	1.62E-03	1.60E-04	1.60E-05	1.60E-05
2,3,4,6,7,8 - HxCDF	3.28E-02		3.28E-03	3.28E-03	3.24E-04	3.24E-05	3.24E-05
1,2,3,4,6,7,8 - HpCDF	4.24E-02		4.24E-04	4.24E-04	4.19E-04	4.19E-06	4.19E-06
1,2,3,4,7,8,9 - HpCDF	5.80E-03		5.80E-05	5.80E-05	5.73E-05	5.73E-07	5.73E-07
1,2,3,4,6,7,8,9 - OCDF	3.12E-02		9.36E-06	9.36E-06	3.08E-04	9.25E-08	9.25E-08
TeCDD Total	3.36E-01				3.33E-03		
PeCDD Total	1.55E-01				1.53E-03		
HxCDD Total	1.79E-01				1.77E-03		
HxCDF Total	2.99E-01				2.96E-03		
OCDD	4.99E-01				4.94E-03		
TeCDF Total	1.12E+01				1.10E-01		
PeCDF Total	1.62E+00				1.60E-02		
HxCDF Total	2.96E-01				2.92E-03		
HpCDF Total	6.72E-02				6.64E-04		
OCDF	3.12E-02				3.08E-04		
PCDD Total	1.47E+00				1.45E-02		
PCDF Total	1.32E+01				1.30E-01		
PCDD/PCDF Total	1.46E+01				1.45E-01		
PCDD TEQ Total			6.14E-02	6.14E-02		6.07E-04	6.07E-04
PCDF TEQ Total			1.45E-01	1.45E-01		1.44E-03	1.44E-03
PCDD/PCDF TEQ Total			2.07E-01	2.07E-01		2.04E-03	2.04E-03

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Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fuel			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	6.70E-04	6.70E-04	6.70E-04	2.82E-01	2.82E-01	2.82E-01
1,2,3,7,8 - PeCDD	2.82E-04	2.82E-04	2.82E-04	1.19E-01	1.19E-01	1.19E-01
1,2,3,4,7,8 - HxCDD	9.19E-05	9.19E-06	9.19E-06	3.87E-02	3.87E-03	3.87E-03
1,2,3,6,7,8 - HxCDD	2.76E-04	2.76E-05	2.76E-05	1.16E-01	1.16E-02	1.16E-02
1,2,3,7,8,9 - HxCDD	2.35E-04	2.35E-05	2.35E-05	9.88E-02	9.88E-03	9.88E-03
1,2,3,4,6,7,8 - HpCDD	2.87E-03	2.87E-05	2.87E-05	1.21E+00	1.21E-02	1.21E-02
1,2,3,4,6,7,8,9 - OCDD	8.50E-03	2.55E-06	2.55E-06	3.58E+00	1.07E-03	1.07E-03
2,3,7,8 - TCDF	1.34E-02	1.34E-03	1.34E-03	5.63E+00	5.63E-01	5.63E-01
1,2,3,7,8 - PeCDF	2.78E-03	8.34E-05	8.34E-05	1.17E+00	3.51E-02	3.51E-02
2,3,4,7,8 - PeCDF	2.77E-03	8.30E-04	8.30E-04	1.16E+00	3.49E-01	3.49E-01
1,2,3,4,7,8 - HxCDF	6.80E-04	6.80E-05	6.80E-05	2.86E-01	2.86E-02	2.86E-02
1,2,3,6,7,8 - HxCDF	6.06E-04	6.06E-05	6.06E-05	2.55E-01	2.55E-02	2.55E-02
1,2,3,7,8,9 - HxCDF	2.76E-04	2.76E-05	2.76E-05	1.16E-01	1.16E-02	1.16E-02
2,3,4,6,7,8 - HxCDF	5.58E-04	5.58E-05	5.58E-05	2.35E-01	2.35E-02	2.35E-02
1,2,3,4,6,7,8 - HpCDF	7.21E-04	7.21E-06	7.21E-06	3.04E-01	3.04E-03	3.04E-03
1,2,3,4,7,8,9 - HpCDF	9.87E-05	9.87E-07	9.87E-07	4.15E-02	4.15E-04	4.15E-04
1,2,3,4,6,7,8,9 - OCDF	5.31E-04	1.59E-07	1.59E-07	2.23E-01	6.70E-05	6.70E-05
TeCDD Total	5.72E-03			2.41E+00		
PeCDD Total	2.63E-03			1.11E+00		
HxCDD Total	3.04E-03			1.28E+00		
HpCDD Total	5.09E-03			2.14E+00		
OCDD	8.50E-03			3.58E+00		
TeCDF Total	1.90E-01			7.99E+01		
PeCDF Total	2.76E-02			1.16E+01		
HxCDF Total	5.03E-03			2.12E+00		
HpCDF Total	1.14E-03			4.81E-01		
OCDF	5.31E-04			2.23E-01		
PCDD Total	2.50E-02			1.05E+01		
PCDF Total	2.24E-01			9.43E+01		
PCDD/PCDF Total	2.49E-01			1.05E+02		
PCDD TEQ Total		1.04E-03	1.04E-03		4.39E-01	4.39E-01
PCDF TEQ Total		2.47E-03	2.47E-03		1.04E+00	1.04E+00
PCDD/PCDF TEQ Total		3.51E-03	3.51E-03		1.48E+00	1.48E+00

Table B-3. PCDD/PCDF data for 0 % NEW 03.

Sample ID PS-100OLD3-073115-02
 MCE 0.920669
 Sampling volume (m³) 118.2
 Carbon sampled (g) 63.9
 Carbon sampled (mg/m³) 540.5
 Carbon fraction 0.4

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample		ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	8.12E-02		8.12E-02	8.12E-02	6.87E-04	6.87E-04	6.87E-04
1,2,3,7,8 - PeCDD	2.38E-02		2.38E-02	2.38E-02	2.01E-04	2.01E-04	2.01E-04
1,2,3,4,7,8 - HxCDD	6.80E-03		6.80E-04	6.80E-04	5.75E-05	5.75E-06	5.75E-06
1,2,3,6,7,8 - HxCDD	1.52E-02		1.52E-03	1.52E-03	1.29E-04	1.29E-05	1.29E-05
1,2,3,7,8,9 - HxCDD	1.24E-02		1.24E-03	1.24E-03	1.05E-04	1.05E-05	1.05E-05
1,2,3,4,6,7,8 - HpCDD	1.69E-01		1.69E-03	1.69E-03	1.43E-03	1.43E-05	1.43E-05
1,2,3,4,6,7,8,9 - OCDD	4.52E-01		1.36E-04	1.36E-04	3.82E-03	1.15E-06	1.15E-06
2,3,7,8 - TCDF	1.82E+00		1.82E-01	1.82E-01	1.54E-02	1.54E-03	1.54E-03
1,2,3,7,8 - PeCDF	3.70E-01		1.11E-02	1.11E-02	3.13E-03	9.38E-05	9.38E-05
2,3,4,7,8 - PeCDF	4.12E-01		1.24E-01	1.24E-01	3.49E-03	1.05E-03	1.05E-03
1,2,3,4,7,8 - HxCDF	7.00E-02		7.00E-03	7.00E-03	5.92E-04	5.92E-05	5.92E-05
1,2,3,6,7,8 - HxCDF	6.74E-02		6.74E-03	6.74E-03	5.70E-04	5.70E-05	5.70E-05
1,2,3,7,8,9 - HxCDF	3.14E-02		3.14E-03	3.14E-03	2.66E-04	2.66E-05	2.66E-05
2,3,4,6,7,8 - HxCDF	5.72E-02		5.72E-03	5.72E-03	4.84E-04	4.84E-05	4.84E-05
1,2,3,4,6,7,8 - HpCDF	5.00E-02		5.00E-04	5.00E-04	4.23E-04	4.23E-06	4.23E-06
1,2,3,4,7,8,9 - HpCDF	1.14E-02		1.14E-04	1.14E-04	9.64E-05	9.64E-07	9.64E-07
1,2,3,4,6,7,8,9 - OCDF	3.34E-02		1.00E-05	1.00E-05	2.82E-04	8.47E-08	8.47E-08
TeCDD Total	4.12E-01				3.48E-03		
PeCDD Total	1.38E-01				1.17E-03		
HxCDD Total	1.74E-01				1.47E-03		
HpCDD Total	2.99E-01				2.53E-03		
OCDD	4.52E-01				3.82E-03		
TeCDF Total	2.20E+01				1.86E-01		
PeCDF Total	3.18E+00				2.69E-02		
HxCDF Total	5.04E-01				4.26E-03		
HpCDF Total	9.92E-02				8.39E-04		
OCDF	3.34E-02				2.82E-04		
PCDD Total	1.48E+00				1.25E-02		
PCDF Total	2.59E+01				2.19E-01		
PCDD/PCDF Total	2.73E+01				2.31E-01		
PCDD TEQ Total			1.10E-01	1.10E-01		9.33E-04	9.33E-04
PCDF TEQ Total			3.40E-01	3.40E-01		2.87E-03	2.87E-03
PCDD/PCDF TEQ Total			4.50E-01	4.50E-01		3.81E-03	3.81E-03

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Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fuel			
	ND = 0	ND = LOD		ND = 0	ND = 0	ND = LOD
2,3,7,8 - TCDD	1.27E-03	1.27E-03	1.27E-03	5.35E-01	5.35E-01	5.35E-01
1,2,3,7,8 - PeCDD	3.72E-04	3.72E-04	3.72E-04	1.57E-01	1.57E-01	1.57E-01
1,2,3,4,7,8 - HxCDD	1.06E-04	1.06E-05	1.06E-05	4.48E-02	4.48E-03	4.48E-03
1,2,3,6,7,8 - HxCDD	2.38E-04	2.38E-05	2.38E-05	1.00E-01	1.00E-02	1.00E-02
1,2,3,7,8,9 - HxCDD	1.94E-04	1.94E-05	1.94E-05	8.17E-02	8.17E-03	8.17E-03
1,2,3,4,6,7,8 - HpCDD	2.65E-03	2.65E-05	2.65E-05	1.11E+00	1.11E-02	1.11E-02
1,2,3,4,6,7,8,9 - OCDD	7.07E-03	2.12E-06	2.12E-06	2.98E+00	8.93E-04	8.93E-04
2,3,7,8 - TCDF	2.85E-02	2.85E-03	2.85E-03	1.20E+01	1.20E+00	1.20E+00
1,2,3,7,8 - PeCDF	5.79E-03	1.74E-04	1.74E-04	2.44E+00	7.31E-02	7.31E-02
2,3,4,7,8 - PeCDF	6.45E-03	1.93E-03	1.93E-03	2.71E+00	8.14E-01	8.14E-01
1,2,3,4,7,8 - HxCDF	1.10E-03	1.10E-04	1.10E-04	4.61E-01	4.61E-02	4.61E-02
1,2,3,6,7,8 - HxCDF	1.05E-03	1.05E-04	1.05E-04	4.44E-01	4.44E-02	4.44E-02
1,2,3,7,8,9 - HxCDF	4.91E-04	4.91E-05	4.91E-05	2.07E-01	2.07E-02	2.07E-02
2,3,4,6,7,8 - HxCDF	8.95E-04	8.95E-05	8.95E-05	3.77E-01	3.77E-02	3.77E-02
1,2,3,4,6,7,8 - HpCDF	7.82E-04	7.82E-06	7.82E-06	3.29E-01	3.29E-03	3.29E-03
1,2,3,4,7,8,9 - HpCDF	1.78E-04	1.78E-06	1.78E-06	7.51E-02	7.51E-04	7.51E-04
1,2,3,4,6,7,8,9 - OCDF	5.23E-04	1.57E-07	1.57E-07	2.20E-01	6.60E-05	6.60E-05
TeCDD Total	6.44E-03			2.71E+00		
PeCDD Total	2.16E-03			9.10E-01		
HxCDD Total	2.73E-03			1.15E+00		
HpCDD Total	4.68E-03			1.97E+00		
OCDD	7.07E-03			2.98E+00		
TeCDF Total	3.45E-01			1.45E+02		
PeCDF Total	4.98E-02			2.10E+01		
HxCDF Total	7.89E-03			3.32E+00		
HpCDF Total	1.55E-03			6.53E-01		
OCDF	5.23E-04			2.20E-01		
PCDD Total	2.31E-02			9.72E+00		
PCDF Total	4.05E-01			1.70E+02		
PCDD/PCDF Total	4.28E-01			1.80E+02		
PCDD TEQ Total		1.73E-03	1.73E-03		7.26E-01	7.26E-01
PCDF TEQ Total		5.32E-03	5.32E-03		2.24E+00	2.24E+00
PCDD/PCDF TEQ Total		7.04E-03	7.04E-03		2.97E+00	2.97E+00

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Table B-4. PCDD/PCDF data for 32 % NEW 01.

Sample ID PS-32NEW-080315-02 MCE 0.935541 Page 1 (2)

Sampling volume (m³) 105.5
 Carbon sampled (g) 58.4
 Carbon sampled (mg/m³) 554.0
 Carbon fraction 0.4

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample		ng/sample	ng/sample	ng/m ³	ng/m ³	ng/m ³
			ND = 0	ND = LOD		ND = 0	ND = LOD
2,3,7,8 - TCDD	9.40E-03		9.40E-03	9.40E-03	8.91E-05	8.91E-05	8.91E-05
1,2,3,7,8 - PeCDD	1.20E-02		1.20E-02	1.20E-02	1.14E-04	1.14E-04	1.14E-04
1,2,3,4,7,8 - HxCDD	4.60E-03		4.60E-04	4.60E-04	4.36E-05	4.36E-06	4.36E-06
1,2,3,6,7,8 - HxCDD	1.22E-02		1.22E-03	1.22E-03	1.16E-04	1.16E-05	1.16E-05
1,2,3,7,8,9 - HxCDD	1.22E-02		1.22E-03	1.22E-03	1.16E-04	1.16E-05	1.16E-05
1,2,3,4,6,7,8 - HpCDD	1.21E-01		1.21E-03	1.21E-03	1.15E-03	1.15E-05	1.15E-05
1,2,3,4,6,7,8,9 - OCDD	3.18E-01		9.53E-05	9.53E-05	3.01E-03	9.04E-07	9.04E-07
2,3,7,8 - TCDF	4.37E-01		4.37E-02	4.37E-02	4.14E-03	4.14E-04	4.14E-04
1,2,3,7,8 - PeCDF	1.25E-01		3.75E-03	3.75E-03	1.19E-03	3.56E-05	3.56E-05
2,3,4,7,8 - PeCDF	1.35E-01		4.04E-02	4.04E-02	1.28E-03	3.83E-04	3.83E-04
1,2,3,4,7,8 - HxCDF	4.48E-02		4.48E-03	4.48E-03	4.25E-04	4.25E-05	4.25E-05
1,2,3,6,7,8 - HxCDF	4.14E-02		4.14E-03	4.14E-03	3.93E-04	3.93E-05	3.93E-05
1,2,3,7,8,9 - HxCDF	2.42E-02		2.42E-03	2.42E-03	2.29E-04	2.29E-05	2.29E-05
2,3,4,6,7,8 - HxCDF	3.96E-02		3.96E-03	3.96E-03	3.75E-04	3.75E-05	3.75E-05
1,2,3,4,6,7,8 - HpCDF	4.20E-02		4.20E-04	4.20E-04	3.98E-04	3.98E-06	3.98E-06
1,2,3,4,7,8,9 - HpCDF	1.40E-02		1.40E-04	1.40E-04	1.33E-04	1.33E-06	1.33E-06
1,2,3,4,6,7,8,9 - OCDF	2.16E-02		6.48E-06	6.48E-06	2.05E-04	6.14E-08	6.14E-08
TeCDD Total	1.54E-01				1.46E-03		
PeCDD Total	9.86E-02				9.35E-04		
HxCDD Total	1.25E-01				1.18E-03		
HxCDD Total	2.01E-01				1.91E-03		
OCDD	3.18E-01				3.01E-03		
TeCDF Total	7.04E+00				6.67E-02		
PeCDF Total	1.28E+00				1.21E-02		
HxCDF Total	3.20E-01				3.03E-03		
HxCDF Total	8.78E-02				8.32E-04		
OCDF	2.50E-02				2.37E-04		
PCDD Total	8.96E-01				8.50E-03		
PCDF Total	8.74E+00				8.29E-02		
PCDD/PCDF Total	9.64E+00				9.14E-02		
PCDD TEQ Total		2.56E-02	2.56E-02			2.43E-04	2.43E-04
PCDF TEQ Total		1.03E-01	1.03E-01			9.80E-04	9.80E-04
PCDD/PCDF TEQ Total		1.29E-01	1.29E-01			1.22E-03	1.22E-03

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fuel			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	1.61E-04	1.61E-04	1.61E-04	7.00E-02	7.00E-02	7.00E-02
1,2,3,7,8 - PeCDD	2.05E-04	2.05E-04	2.05E-04	8.94E-02	8.94E-02	8.94E-02
1,2,3,4,7,8 - HxCDD	7.87E-05	7.87E-06	7.87E-06	3.43E-02	3.43E-03	3.43E-03
1,2,3,6,7,8 - HxCDD	2.09E-04	2.09E-05	2.09E-05	9.08E-02	9.08E-03	9.08E-03
1,2,3,7,8,9 - HxCDD	2.09E-04	2.09E-05	2.09E-05	9.08E-02	9.08E-03	9.08E-03
1,2,3,4,6,7,8 - HpCDD	2.07E-03	2.07E-05	2.07E-05	9.01E-01	9.01E-03	9.01E-03
1,2,3,4,6,7,8,9 - OCDD	5.44E-03	1.63E-06	1.63E-06	2.37E+00	7.10E-04	7.10E-04
2,3,7,8 - TCDF	7.48E-03	7.48E-04	7.48E-04	3.25E+00	3.25E-01	3.25E-01
1,2,3,7,8 - PeCDF	2.14E-03	6.42E-05	6.42E-05	9.31E-01	2.79E-02	2.79E-02
2,3,4,7,8 - PeCDF	2.30E-03	6.91E-04	6.91E-04	1.00E+00	3.01E-01	3.01E-01
1,2,3,4,7,8 - HxCDF	7.67E-04	7.67E-05	7.67E-05	3.34E-01	3.34E-02	3.34E-02
1,2,3,6,7,8 - HxCDF	7.08E-04	7.08E-05	7.08E-05	3.08E-01	3.08E-02	3.08E-02
1,2,3,7,8,9 - HxCDF	4.14E-04	4.14E-05	4.14E-05	1.80E-01	1.80E-02	1.80E-02
2,3,4,6,7,8 - HxCDF	6.78E-04	6.78E-05	6.78E-05	2.95E-01	2.95E-02	2.95E-02
1,2,3,4,6,7,8 - HpCDF	7.19E-04	7.19E-06	7.19E-06	3.13E-01	3.13E-03	3.13E-03
1,2,3,4,7,8,9 - HpCDF	2.40E-04	2.40E-06	2.40E-06	1.04E-01	1.04E-03	1.04E-03
1,2,3,4,6,7,8,9 - OCDF	3.70E-04	1.11E-07	1.11E-07	1.61E-01	4.83E-05	4.83E-05
TeCDD Total	2.63E-03			1.15E+00		
PeCDD Total	1.69E-03			7.34E-01		
HxCDD Total	2.14E-03			9.29E-01		
HpCDD Total	3.44E-03			1.50E+00		
OCDD	5.44E-03			2.37E+00		
TeCDF Total	1.20E-01			5.24E+01		
PeCDF Total	2.18E-02			9.50E+00		
HxCDF Total	5.47E-03			2.38E+00		
HpCDF Total	1.50E-03			6.54E-01		
OCDF	4.28E-04			1.86E-01		
PCDD Total	1.53E-02			6.67E+00		
PCDF Total	1.50E-01			6.51E+01		
PCDD/PCDF Total	1.65E-01			7.18E+01		
PCDD TEQ Total		4.38E-04	4.38E-04		1.91E-01	1.91E-01
PCDF TEQ Total		1.77E-03	1.77E-03		7.70E-01	7.70E-01
PCDD/PCDF TEQ Total		2.21E-03	2.21E-03		9.61E-01	9.61E-01

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Table B-5. PCDD/PCDF data for 32 % NEW 02.

Sample ID	PS-32NEW2-080415-01	MCE	0.932435	Page 1 (2)
Sampling volume (m ³)	127.8			

Carbon sampled (g)	75.6
Carbon sampled (mg/m ³)	591.4
Carbon fraction	0.4

Isomer.	Total ng/sample	LOD	TEQ	TEQ	Total	TEQ	TEQ
			ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	1.54E-02		1.54E-02	1.54E-02	1.21E-04	1.21E-04	1.21E-04
1,2,3,7,8 - PeCDD	1.92E-02		1.92E-02	1.92E-02	1.50E-04	1.50E-04	1.50E-04
1,2,3,4,7,8 - HxCDD	7.40E-03		7.40E-04	7.40E-04	5.79E-05	5.79E-06	5.79E-06
1,2,3,6,7,8 - HxCDD	1.26E-02		1.26E-03	1.26E-03	9.86E-05	9.86E-06	9.86E-06
1,2,3,7,8,9 - HxCDD	1.30E-02		1.30E-03	1.30E-03	1.02E-04	1.02E-05	1.02E-05
1,2,3,4,6,7,8 - HpCDD	1.44E-01		1.44E-03	1.44E-03	1.13E-03	1.13E-05	1.13E-05
1,2,3,4,6,7,8,9 - OCDD	4.53E-01		1.36E-04	1.36E-04	3.54E-03	1.06E-06	1.06E-06
2,3,7,8 - TCDF	8.45E-01		8.45E-02	8.45E-02	6.62E-03	6.62E-04	6.62E-04
1,2,3,7,8 - PeCDF	1.89E-01		5.67E-03	5.67E-03	1.48E-03	4.44E-05	4.44E-05
2,3,4,7,8 - PeCDF	1.82E-01		5.47E-02	5.47E-02	1.43E-03	4.28E-04	4.28E-04
1,2,3,4,7,8 - HxCDF	5.14E-02		5.14E-03	5.14E-03	4.02E-04	4.02E-05	4.02E-05
1,2,3,6,7,8 - HxCDF	4.96E-02		4.96E-03	4.96E-03	3.88E-04	3.88E-05	3.88E-05
1,2,3,7,8,9 - HxCDF	2.56E-02		2.56E-03	2.56E-03	2.00E-04	2.00E-05	2.00E-05
2,3,4,6,7,8 - HxCDF	4.30E-02		4.30E-03	4.30E-03	3.36E-04	3.36E-05	3.36E-05
1,2,3,4,6,7,8 - HpCDF	4.64E-02		4.64E-04	4.64E-04	3.63E-04	3.63E-06	3.63E-06
1,2,3,4,7,8,9 - HpCDF	1.18E-02		1.18E-04	1.18E-04	9.23E-05	9.23E-07	9.23E-07
1,2,3,4,6,7,8,9 - OCDF	4.36E-02		1.31E-05	1.31E-05	3.41E-04	1.02E-07	1.02E-07
TeCDD Total	1.89E-01				1.48E-03		
PeCDD Total	1.31E-01				1.03E-03		
HxCDD Total	1.47E-01				1.15E-03		
HpCDD Total	2.53E-01				1.98E-03		
OCDD	4.53E-01				3.54E-03		
TeCDF Total	1.28E+01				1.00E-01		
PeCDF Total	1.91E+00				1.49E-02		
HxCDF Total	3.45E-01				2.70E-03		
HpCDF Total	8.08E-02				6.32E-04		
OCDF	4.36E-02				3.41E-04		
PCDD Total	1.17E+00				9.18E-03		
PCDF Total	1.52E+01				1.19E-01		
PCDD/PCDF Total	1.64E+01				1.28E-01		
PCDD TEQ Total			3.95E-02	3.95E-02		3.09E-04	3.09E-04
PCDF TEQ Total			1.62E-01	1.62E-01		1.27E-03	1.27E-03
PCDD/PCDF TEQ Total			2.02E-01	2.02E-01		1.58E-03	1.58E-03

Isomer.	EF	EF	EF	EF	EF	EF
	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fuel		ND = LOD	
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	2.04E-04	2.04E-04	2.04E-04	8.87E-02	8.87E-02	8.87E-02
1,2,3,7,8 - PeCDD	2.54E-04	2.54E-04	2.54E-04	1.11E-01	1.11E-01	1.11E-01
1,2,3,4,7,8 - HxCDD	9.79E-05	9.79E-06	9.79E-06	4.26E-02	4.26E-03	4.26E-03
1,2,3,6,7,8 - HxCDD	1.67E-04	1.67E-05	1.67E-05	7.26E-02	7.26E-03	7.26E-03
1,2,3,7,8,9 - HxCDD	1.72E-04	1.72E-05	1.72E-05	7.49E-02	7.49E-03	7.49E-03
1,2,3,4,6,7,8 - HpCDD	1.91E-03	1.91E-05	1.91E-05	8.30E-01	8.30E-03	8.30E-03
1,2,3,4,6,7,8,9 - OCDD	5.99E-03	1.80E-06	1.80E-06	2.61E+00	7.82E-04	7.82E-04
2,3,7,8 - TCDF	1.12E-02	1.12E-03	1.12E-03	4.87E+00	4.87E-01	4.87E-01
1,2,3,7,8 - PeCDF	2.50E-03	7.50E-05	7.50E-05	1.09E+00	3.26E-02	3.26E-02
2,3,4,7,8 - PeCDF	2.41E-03	7.23E-04	7.23E-04	1.05E+00	3.15E-01	3.15E-01
1,2,3,4,7,8 - HxCDF	6.80E-04	6.80E-05	6.80E-05	2.96E-01	2.96E-02	2.96E-02
1,2,3,6,7,8 - HxCDF	6.56E-04	6.56E-05	6.56E-05	2.86E-01	2.86E-02	2.86E-02
1,2,3,7,8,9 - HxCDF	3.39E-04	3.39E-05	3.39E-05	1.47E-01	1.47E-02	1.47E-02
2,3,4,6,7,8 - HxCDF	5.69E-04	5.69E-05	5.69E-05	2.48E-01	2.48E-02	2.48E-02
1,2,3,4,6,7,8 - HpCDF	6.14E-04	6.14E-06	6.14E-06	2.67E-01	2.67E-03	2.67E-03
1,2,3,4,7,8,9 - HpCDF	1.56E-04	1.56E-06	1.56E-06	6.79E-02	6.79E-04	6.79E-04
1,2,3,4,6,7,8,9 - OCDF	5.77E-04	1.73E-07	1.73E-07	2.51E-01	7.53E-05	7.53E-05
TeCDD Total	2.51E-03			1.09E+00		
PeCDD Total	1.74E-03			7.55E-01		
HxCDD Total	1.95E-03			8.46E-01		
HpCDD Total	3.35E-03			1.46E+00		
OCDD	5.99E-03			2.61E+00		
TeCDF Total	1.70E-01			7.38E+01		
PeCDF Total	2.52E-02			1.10E+01		
HxCDF Total	4.57E-03			1.99E+00		
HpCDF Total	1.07E-03			4.65E-01		
OCDF	5.77E-04			2.51E-01		
PCDD Total	1.55E-02			6.76E+00		
PCDF Total	2.01E-01			8.74E+01		
PCDD/PCDF Total	2.16E-01			9.42E+01		
PCDD TEQ Total		5.22E-04	5.22E-04		2.27E-01	2.27E-01
PCDF TEQ Total		2.15E-03	2.15E-03		9.35E-01	9.35E-01
PCDD/PCDF TEQ Total		2.67E-03	2.67E-03		1.16E+00	1.16E+00

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Table B-6. PCDD/PCDF data for 32 % NEW 03.

Sample ID	PS-32NEW3-080615	MCE	0.934109	Page 1 (2)
Sampling volume (m ³)	129.6			

Carbon sampled (g)	87.9
Carbon sampled (mg/m ³)	678.1
Carbon fraction	0.435

Isomer.	Total	LOD	TEQ ng/sample	TEQ ng/sample	Total	TEQ ng/m ³	TEQ ng/m ³
	ng/sample	ND = 0	ND = LOD	ng/m ³	ng/m ³	ND = 0	ND = LOD
2,3,7,8 - TCDD	8.00E-03		8.00E-03	8.00E-03	6.17E-05	6.17E-05	6.17E-05
1,2,3,7,8 - PeCDD	1.30E-02		1.30E-02	1.30E-02	1.00E-04	1.00E-04	1.00E-04
1,2,3,4,7,8 - HxCDD	4.20E-03		4.20E-04	4.20E-04	3.24E-05	3.24E-06	3.24E-06
1,2,3,6,7,8 - HxCDD	1.40E-02		1.40E-03	1.40E-03	1.08E-04	1.08E-05	1.08E-05
1,2,3,7,8,9 - HxCDD	1.02E-02		1.02E-03	1.02E-03	7.87E-05	7.87E-06	7.87E-06
1,2,3,4,6,7,8 - HpCDD	1.86E-01		1.86E-03	1.86E-03	1.44E-03	1.44E-05	1.44E-05
1,2,3,4,6,7,8,9 - OCDD	5.00E-01		1.50E-04	1.50E-04	3.86E-03	1.16E-06	1.16E-06
2,3,7,8 - TCDF	4.04E-01		4.04E-02	4.04E-02	3.12E-03	3.12E-04	3.12E-04
1,2,3,7,8 - PeCDF	1.17E-01		3.50E-03	3.50E-03	9.00E-04	2.70E-05	2.70E-05
2,3,4,7,8 - PeCDF	1.21E-01		3.62E-02	3.62E-02	9.32E-04	2.80E-04	2.80E-04
1,2,3,4,7,8 - HxCDF	3.48E-02		3.48E-03	3.48E-03	2.69E-04	2.69E-05	2.69E-05
1,2,3,6,7,8 - HxCDF	4.14E-02		4.14E-03	4.14E-03	3.20E-04	3.20E-05	3.20E-05
1,2,3,7,8,9 - HxCDF	1.48E-02		1.48E-03	1.48E-03	1.14E-04	1.14E-05	1.14E-05
2,3,4,6,7,8 - HxCDF	3.44E-02		3.44E-03	3.44E-03	2.65E-04	2.65E-05	2.65E-05
1,2,3,4,6,7,8 - HpCDF	3.84E-02		3.84E-04	3.84E-04	2.96E-04	2.96E-06	2.96E-06
1,2,3,4,7,8,9 - HpCDF	1.02E-02		1.02E-04	1.02E-04	7.87E-05	7.87E-07	7.87E-07
1,2,3,4,6,7,8,9 - OCDF	4.42E-02		1.33E-05	1.33E-05	3.41E-04	1.02E-07	1.02E-07
TeCDD Total	1.21E-01				9.35E-04		
PeCDD Total	8.76E-02				6.76E-04		
HxCDD Total	1.43E-01				1.10E-03		
HpCDD Total	3.25E-01				2.51E-03		
OCDD	5.00E-01				3.86E-03		
TeCDF Total	9.04E+00				6.98E-02		
PeCDF Total	1.35E+00				1.04E-02		
HxCDF Total	3.06E-01				2.36E-03		
HpCDF Total	7.86E-02				6.07E-04		
OCDF	4.42E-02				3.41E-04		
PCDD Total	1.18E+00				9.09E-03		
PCDF Total	1.08E+01				8.35E-02		
PCDD/PCDF Total	1.20E+01				9.26E-02		
PCDD TEQ Total			2.59E-02	2.59E-02		2.00E-04	2.00E-04
PCDF TEQ Total			9.32E-02	9.32E-02		7.19E-04	7.19E-04
PCDD/PCDF TEQ Total			1.19E-01	1.19E-01		9.19E-04	9.19E-04

EF	EF	EF	EF	EF	EF
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Isomer.	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fuel		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	9.11E-05	9.11E-05	9.11E-05	3.96E-02	3.96E-02	3.96E-02
1,2,3,7,8 - PeCDD	1.48E-04	1.48E-04	1.48E-04	6.44E-02	6.44E-02	6.44E-02
1,2,3,4,7,8 - HxCDD	4.78E-05	4.78E-06	4.78E-06	2.08E-02	2.08E-03	2.08E-03
1,2,3,6,7,8 - HxCDD	1.59E-04	1.59E-05	1.59E-05	6.93E-02	6.93E-03	6.93E-03
1,2,3,7,8,9 - HxCDD	1.16E-04	1.16E-05	1.16E-05	5.05E-02	5.05E-03	5.05E-03
1,2,3,4,6,7,8 - HpCDD	2.12E-03	2.12E-05	2.12E-05	9.21E-01	9.21E-03	9.21E-03
1,2,3,4,6,7,8,9 - OCDD	5.69E-03	1.71E-06	1.71E-06	2.48E+00	7.43E-04	7.43E-04
2,3,7,8 - TCDF	4.60E-03	4.60E-04	4.60E-04	2.00E+00	2.00E-01	2.00E-01
1,2,3,7,8 - PeCDF	1.33E-03	3.98E-05	3.98E-05	5.77E-01	1.73E-02	1.73E-02
2,3,4,7,8 - PeCDF	1.37E-03	4.12E-04	4.12E-04	5.98E-01	1.79E-01	1.79E-01
1,2,3,4,7,8 - HxCDF	3.96E-04	3.96E-05	3.96E-05	1.72E-01	1.72E-02	1.72E-02
1,2,3,6,7,8 - HxCDF	4.71E-04	4.71E-05	4.71E-05	2.05E-01	2.05E-02	2.05E-02
1,2,3,7,8,9 - HxCDF	1.68E-04	1.68E-05	1.68E-05	7.33E-02	7.33E-03	7.33E-03
2,3,4,6,7,8 - HxCDF	3.92E-04	3.92E-05	3.92E-05	1.70E-01	1.70E-02	1.70E-02
1,2,3,4,6,7,8 - HpCDF	4.37E-04	4.37E-06	4.37E-06	1.90E-01	1.90E-03	1.90E-03
1,2,3,4,7,8,9 - HpCDF	1.16E-04	1.16E-06	1.16E-06	5.05E-02	5.05E-04	5.05E-04
1,2,3,4,6,7,8,9 - OCDF	5.03E-04	1.51E-07	1.51E-07	2.19E-01	6.57E-05	6.57E-05
TeCDD Total	1.38E-03			6.00E-01		
PeCDD Total	9.97E-04			4.34E-01		
HxCDD Total	1.63E-03			7.08E-01		
HpCDD Total	3.70E-03			1.61E+00		
OCDD	5.69E-03			2.48E+00		
TeCDF Total	1.03E-01			4.48E+01		
PeCDF Total	1.53E-02			6.67E+00		
HxCDF Total	3.49E-03			1.52E+00		
HpCDF Total	8.95E-04			3.89E-01		
OCDF	5.03E-04			2.19E-01		
PCDD Total	1.34E-02			5.83E+00		
PCDF Total	1.23E-01			5.36E+01		
PCDD/PCDF Total	1.37E-01			5.94E+01		
PCDD TEQ Total		2.94E-04	2.94E-04		1.28E-01	1.28E-01
PCDF TEQ Total		1.06E-03	1.06E-03		4.61E-01	4.61E-01
PCDD/PCDF TEQ Total		1.35E-03	1.35E-03		5.89E-01	5.89E-01

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Table B-7. PCDD/PCDF data for 66 % NEW 01.

Sample ID	PS-66NEW-081215	MCE	0.934443	Page 1 (2)
Sampling volume (m ³)	99.5			
Carbon sampled (g)	61.6			

Carbon sampled (mg/m³) 619.1
 Carbon fraction 0.426

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample	TEQ ND = LOD	Total ng/m ³	TEQ ng/m ³	TEQ ND = LOD
			ND = 0	ND = LOD	ND = 0	ND = LOD	ND = LOD
2,3,7,8 - TCDD	2.40E-03		2.40E-03	2.40E-03	2.41E-05	2.41E-05	2.41E-05
1,2,3,7,8 - PeCDD	6.20E-03		6.20E-03	6.20E-03	6.23E-05	6.23E-05	6.23E-05
1,2,3,4,7,8 - HxCDD	4.00E-03		4.00E-04	4.00E-04	4.02E-05	4.02E-06	4.02E-06
1,2,3,6,7,8 - HxCDD	1.02E-02		1.02E-03	1.02E-03	1.02E-04	1.02E-05	1.02E-05
1,2,3,7,8,9 - HxCDD	9.40E-03		9.40E-04	9.40E-04	9.45E-05	9.45E-06	9.45E-06
1,2,3,4,6,7,8 - HpCDD	1.33E-01		1.33E-03	1.33E-03	1.33E-03	1.33E-05	1.33E-05
1,2,3,4,6,7,8,9 - OCDD	4.04E-01		1.21E-04	1.21E-04	4.06E-03	1.22E-06	1.22E-06
2,3,7,8 - TCDF	7.90E-02		7.90E-03	7.90E-03	7.94E-04	7.94E-05	7.94E-05
1,2,3,7,8 - PeCDF	2.04E-02		6.12E-04	6.12E-04	2.05E-04	6.15E-06	6.15E-06
2,3,4,7,8 - PeCDF	2.20E-02		6.60E-03	6.60E-03	2.21E-04	6.63E-05	6.63E-05
1,2,3,4,7,8 - HxCDF	1.28E-02		1.28E-03	1.28E-03	1.29E-04	1.29E-05	1.29E-05
1,2,3,6,7,8 - HxCDF	1.00E-02		1.00E-03	1.00E-03	1.00E-04	1.00E-05	1.00E-05
1,2,3,7,8,9 - HxCDF	5.20E-03		5.20E-04	5.20E-04	5.23E-05	5.23E-06	5.23E-06
2,3,4,6,7,8 - HxCDF	1.12E-02		1.12E-03	1.12E-03	1.13E-04	1.13E-05	1.13E-05
1,2,3,4,6,7,8 - HpCDF	2.38E-02		2.38E-04	2.38E-04	2.39E-04	2.39E-06	2.39E-06
1,2,3,4,7,8,9 - HpCDF	4.40E-03		4.40E-05	4.40E-05	4.42E-05	4.42E-07	4.42E-07
1,2,3,4,6,7,8,9 - OCDF	2.82E-02		8.46E-06	8.46E-06	2.83E-04	8.50E-08	8.50E-08
TeCDD Total	1.20E-01				1.21E-03		
PeCDD Total	7.30E-02				7.34E-04		
HxCDD Total	1.03E-01				1.04E-03		
HpCDD Total	2.16E-01				2.17E-03		
OCDD	4.04E-01				4.06E-03		
TeCDF Total	2.66E+00				2.67E-02		
PeCDF Total	2.50E-01				2.51E-03		
HxCDF Total	9.08E-02				9.12E-04		
HpCDF Total	3.48E-02				3.50E-04		
OCDF	2.82E-02				2.83E-04		
PCDD Total	9.17E-01				9.21E-03		
PCDF Total	3.06E+00				3.08E-02		
PCDD/PCDF Total	3.98E+00				4.00E-02		
PCDD TEQ Total			1.24E-02	1.24E-02		1.25E-04	1.25E-04
PCDF TEQ Total			1.93E-02	1.93E-02		1.94E-04	1.94E-04
PCDD/PCDF TEQ Total			3.17E-02	3.17E-02		3.19E-04	3.19E-04

Sample ID

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Page 2 (2)

EF	EF	EF	EF	EF	EF
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Isomer.	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon			ng/kg fuel		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	3.90E-05	3.90E-05	3.90E-05	1.66E-02	1.66E-02	1.66E-02
1,2,3,7,8 - PeCDD	1.01E-04	1.01E-04	1.01E-04	4.29E-02	4.29E-02	4.29E-02
1,2,3,4,7,8 - HxCDD	6.49E-05	6.49E-06	6.49E-06	2.77E-02	2.77E-03	2.77E-03
1,2,3,6,7,8 - HxCDD	1.66E-04	1.66E-05	1.66E-05	7.05E-02	7.05E-03	7.05E-03
1,2,3,7,8,9 - HxCDD	1.53E-04	1.53E-05	1.53E-05	6.50E-02	6.50E-03	6.50E-03
1,2,3,4,6,7,8 - HpCDD	2.15E-03	2.15E-05	2.15E-05	9.17E-01	9.17E-03	9.17E-03
1,2,3,4,6,7,8,9 - OCDD	6.56E-03	1.97E-06	1.97E-06	2.79E+00	8.38E-04	8.38E-04
2,3,7,8 - TCDF	1.28E-03	1.28E-04	1.28E-04	5.46E-01	5.46E-02	5.46E-02
1,2,3,7,8 - PeCDF	3.31E-04	9.93E-06	9.93E-06	1.41E-01	4.23E-03	4.23E-03
2,3,4,7,8 - PeCDF	3.57E-04	1.07E-04	1.07E-04	1.52E-01	4.56E-02	4.56E-02
1,2,3,4,7,8 - HxCDF	2.08E-04	2.08E-05	2.08E-05	8.85E-02	8.85E-03	8.85E-03
1,2,3,6,7,8 - HxCDF	1.62E-04	1.62E-05	1.62E-05	6.91E-02	6.91E-03	6.91E-03
1,2,3,7,8,9 - HxCDF	8.44E-05	8.44E-06	8.44E-06	3.59E-02	3.59E-03	3.59E-03
2,3,4,6,7,8 - HxCDF	1.82E-04	1.82E-05	1.82E-05	7.74E-02	7.74E-03	7.74E-03
1,2,3,4,6,7,8 - HpCDF	3.86E-04	3.86E-06	3.86E-06	1.65E-01	1.65E-03	1.65E-03
1,2,3,4,7,8,9 - HpCDF	7.14E-05	7.14E-07	7.14E-07	3.04E-02	3.04E-04	3.04E-04
1,2,3,4,6,7,8,9 - OCDF	4.58E-04	1.37E-07	1.37E-07	1.95E-01	5.85E-05	5.85E-05
TeCDD Total	1.95E-03			8.31E-01		
PeCDD Total	1.18E-03			5.05E-01		
HxCDD Total	1.67E-03			7.12E-01		
HpCDD Total	3.51E-03			1.49E+00		
OCDD	6.56E-03			2.79E+00		
TeCDF Total	4.31E-02			1.84E+01		
PeCDF Total	4.05E-03			1.73E+00		
HxCDF Total	1.47E-03			6.28E-01		
HpCDF Total	5.65E-04			2.41E-01		
OCDF	4.58E-04			1.95E-01		
PCDD Total	1.49E-02			6.34E+00		
PCDF Total	4.97E-02			2.12E+01		
PCDD/PCDF Total	6.46E-02			2.75E+01		
PCDD TEQ Total		2.01E-04	2.01E-04		8.58E-02	8.58E-02
PCDF TEQ Total		3.14E-04	3.14E-04		1.34E-01	1.34E-01
PCDD/PCDF TEQ Total		5.15E-04	5.15E-04		2.19E-01	2.19E-01

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Table B-8. PCDD/PCDF data for 66 % NEW 02.

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Sample ID	PS-66NEW2-081315-01	MCE	0.945527
Sampling volume (m ³)	91.1		
Carbon sampled (g)	67.8		

Carbon sampled (mg/m³) 744.6
 Carbon fraction 0.4

Isomer.	Total	LOD	TEQ	TEQ	Total	TEQ	TEQ
	ng/sample	ng/sample	ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	3.00E-03		3.00E-03	3.00E-03	3.29E-05	3.29E-05	3.29E-05
1,2,3,7,8 - PeCDD	4.00E-03		4.00E-03	4.00E-03	4.39E-05	4.39E-05	4.39E-05
1,2,3,4,7,8 - HxCDD	3.00E-03		3.00E-04	3.00E-04	3.29E-05	3.29E-06	3.29E-06
1,2,3,6,7,8 - HxCDD	8.20E-03		8.20E-04	8.20E-04	9.00E-05	9.00E-06	9.00E-06
1,2,3,7,8,9 - HxCDD	7.80E-03		7.80E-04	7.80E-04	8.56E-05	8.56E-06	8.56E-06
1,2,3,4,6,7,8 - HpCDD	1.35E-01		1.35E-03	1.35E-03	1.48E-03	1.48E-05	1.48E-05
1,2,3,4,6,7,8,9 - OCDD	4.14E-01		1.24E-04	1.24E-04	4.55E-03	1.36E-06	1.36E-06
2,3,7,8 - TCDF	1.16E-01		1.16E-02	1.16E-02	1.28E-03	1.28E-04	1.28E-04
1,2,3,7,8 - PeCDF	2.72E-02		8.16E-04	8.16E-04	2.99E-04	8.96E-06	8.96E-06
2,3,4,7,8 - PeCDF	2.62E-02		7.86E-03	7.86E-03	2.88E-04	8.63E-05	8.63E-05
1,2,3,4,7,8 - HxCDF	1.00E-02		1.00E-03	1.00E-03	1.10E-04	1.10E-05	1.10E-05
1,2,3,6,7,8 - HxCDF	1.10E-02		1.10E-03	1.10E-03	1.21E-04	1.21E-05	1.21E-05
1,2,3,7,8,9 - HxCDF	4.60E-03		4.60E-04	4.60E-04	5.05E-05	5.05E-06	5.05E-06
2,3,4,6,7,8 - HxCDF	9.40E-03		9.40E-04	9.40E-04	1.03E-04	1.03E-05	1.03E-05
1,2,3,4,6,7,8 - HpCDF	1.86E-02		1.86E-04	1.86E-04	2.04E-04	2.04E-06	2.04E-06
1,2,3,4,7,8,9 - HpCDF	3.20E-03		3.20E-05	3.20E-05	3.51E-05	3.51E-07	3.51E-07
1,2,3,4,6,7,8,9 - OCDF	2.28E-02		6.84E-06	6.84E-06	2.50E-04	7.51E-08	7.51E-08
TeCDD Total	8.66E-02				9.51E-04		
PeCDD Total	4.18E-02				4.59E-04		
HxCDD Total	8.42E-02				9.24E-04		
HpCDD Total	2.21E-01				2.43E-03		
OCDD	4.14E-01				4.55E-03		
TeCDF Total	3.91E+00				4.29E-02		
PeCDF Total	2.76E-01				3.03E-03		
HxCDF Total	6.66E-02				7.31E-04		
HpCDF Total	3.92E-02				4.30E-04		
OCDF	2.28E-02				2.50E-04		
PCDD Total	8.48E-01				9.31E-03		
PCDF Total	4.32E+00				4.74E-02		
PCDD/PCDF Total	5.16E+00				5.67E-02		
PCDD TEQ Total			1.04E-02	1.04E-02		1.14E-04	1.14E-04
PCDF TEQ Total			2.40E-02	2.40E-02		2.64E-04	2.64E-04
PCDD/PCDF TEQ Total			3.44E-02	3.44E-02		3.78E-04	3.78E-04

Sample ID

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EF	EF	EF	EF	EF	EF
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Isomer.	Total	TEQ	TEQ	Total	TEQ	TEQ
	ng/g Carbon		ng/kg fuel			
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	4.42E-05	4.42E-05	4.42E-05	1.88E-02	1.88E-02	1.88E-02
1,2,3,7,8 - PeCDD	5.90E-05	5.90E-05	5.90E-05	2.51E-02	2.51E-02	2.51E-02
1,2,3,4,7,8 - HxCDD	4.42E-05	4.42E-06	4.42E-06	1.88E-02	1.88E-03	1.88E-03
1,2,3,6,7,8 - HxCDD	1.21E-04	1.21E-05	1.21E-05	5.15E-02	5.15E-03	5.15E-03
1,2,3,7,8,9 - HxCDD	1.15E-04	1.15E-05	1.15E-05	4.90E-02	4.90E-03	4.90E-03
1,2,3,4,6,7,8 - HpCDD	1.98E-03	1.98E-05	1.98E-05	8.45E-01	8.45E-03	8.45E-03
1,2,3,4,6,7,8,9 - OCDD	6.11E-03	1.83E-06	1.83E-06	2.60E+00	7.80E-04	7.80E-04
2,3,7,8 - TCDF	1.71E-03	1.71E-04	1.71E-04	7.30E-01	7.30E-02	7.30E-02
1,2,3,7,8 - PeCDF	4.01E-04	1.20E-05	1.20E-05	1.71E-01	5.13E-03	5.13E-03
2,3,4,7,8 - PeCDF	3.86E-04	1.16E-04	1.16E-04	1.65E-01	4.94E-02	4.94E-02
1,2,3,4,7,8 - HxCDF	1.47E-04	1.47E-05	1.47E-05	6.28E-02	6.28E-03	6.28E-03
1,2,3,6,7,8 - HxCDF	1.62E-04	1.62E-05	1.62E-05	6.91E-02	6.91E-03	6.91E-03
1,2,3,7,8,9 - HxCDF	6.78E-05	6.78E-06	6.78E-06	2.89E-02	2.89E-03	2.89E-03
2,3,4,6,7,8 - HxCDF	1.39E-04	1.39E-05	1.39E-05	5.90E-02	5.90E-03	5.90E-03
1,2,3,4,6,7,8 - HpCDF	2.74E-04	2.74E-06	2.74E-06	1.17E-01	1.17E-03	1.17E-03
1,2,3,4,7,8,9 - HpCDF	4.72E-05	4.72E-07	4.72E-07	2.01E-02	2.01E-04	2.01E-04
1,2,3,4,6,7,8,9 - OCDF	3.36E-04	1.01E-07	1.01E-07	1.43E-01	4.30E-05	4.30E-05
TeCDD Total	1.28E-03			5.44E-01		
PeCDD Total	6.16E-04			2.63E-01		
HxCDD Total	1.24E-03			5.29E-01		
HpCDD Total	3.26E-03			1.39E+00		
OCDD	6.11E-03			2.60E+00		
TeCDF Total	5.77E-02			2.46E+01		
PeCDF Total	4.06E-03			1.73E+00		
HxCDF Total	9.82E-04			4.18E-01		
HpCDF Total	5.78E-04			2.46E-01		
OCDF	3.36E-04			1.43E-01		
PCDD Total	1.25E-02			5.32E+00		
PCDF Total	6.36E-02			2.71E+01		
PCDD/PCDF Total	7.61E-02			3.24E+01		
PCDD TEQ Total		1.53E-04	1.53E-04		6.51E-02	6.51E-02
PCDF TEQ Total		3.54E-04	3.54E-04		1.51E-01	1.51E-01
PCDD/PCDF TEQ Total		5.07E-04	5.07E-04		2.16E-01	2.16E-01

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Table B-9. PCDD/PCDF data for 66 % NEW 03.

Sample ID	PS-66NEW3-081315-02	MCE	0.957416	Page 1 (2)
Sampling volume (m ³)	82.8			
Carbon sampled (g)	58.7			
Carbon sampled (mg/m ³)	709.3			

Carbon fraction

0.4

Isomer.	Total	LOD	TEQ ng/sample	TEQ ND = 0	Total	TEQ ng/m³	TEQ ND = 0
	ng/sample		ng/sample ND = LOD	ng/m³	ng/m³	ng/m³ ND = LOD	
2,3,7,8 - TCDD	6.60E-03		6.60E-03	6.60E-03	7.97E-05	7.97E-05	7.97E-05
1,2,3,7,8 - PeCDD	6.60E-03		6.60E-03	6.60E-03	7.97E-05	7.97E-05	7.97E-05
1,2,3,4,7,8 - HxCDD	3.40E-03		3.40E-04	3.40E-04	4.11E-05	4.11E-06	4.11E-06
1,2,3,6,7,8 - HxCDD	9.80E-03		9.80E-04	9.80E-04	1.18E-04	1.18E-05	1.18E-05
1,2,3,7,8,9 - HxCDD	8.60E-03		8.60E-04	8.60E-04	1.04E-04	1.04E-05	1.04E-05
1,2,3,4,6,7,8 - HpCDD	1.27E-01		1.27E-03	1.27E-03	1.54E-03	1.54E-05	1.54E-05
1,2,3,4,6,7,8,9 - OCDD	3.78E-01		1.13E-04	1.13E-04	4.57E-03	1.37E-06	1.37E-06
2,3,7,8 - TCDF	2.24E-01		2.24E-02	2.24E-02	2.71E-03	2.71E-04	2.71E-04
1,2,3,7,8 - PeCDF	5.84E-02		1.75E-03	1.75E-03	7.05E-04	2.12E-05	2.12E-05
2,3,4,7,8 - PeCDF	5.92E-02		1.78E-02	1.78E-02	7.15E-04	2.15E-04	2.15E-04
1,2,3,4,7,8 - HxCDF	1.68E-02		1.68E-03	1.68E-03	2.03E-04	2.03E-05	2.03E-05
1,2,3,6,7,8 - HxCDF	1.66E-02		1.66E-03	1.66E-03	2.01E-04	2.01E-05	2.01E-05
1,2,3,7,8,9 - HxCDF	7.60E-03		7.60E-04	7.60E-04	9.18E-05	9.18E-06	9.18E-06
2,3,4,6,7,8 - HxCDF	1.56E-02		1.56E-03	1.56E-03	1.88E-04	1.88E-05	1.88E-05
1,2,3,4,6,7,8 - HpCDF	2.12E-02		2.12E-04	2.12E-04	2.56E-04	2.56E-06	2.56E-06
1,2,3,4,7,8,9 - HpCDF	4.20E-03		4.20E-05	4.20E-05	5.07E-05	5.07E-07	5.07E-07
1,2,3,4,6,7,8,9 - OCDF	1.96E-02		5.88E-06	5.88E-06	2.37E-04	7.10E-08	7.10E-08
TeCDD Total	9.96E-02				1.20E-03		
PeCDD Total	4.64E-02				5.60E-04		
HxCDD Total	9.50E-02				1.15E-03		
HpCDD Total	2.17E-01				2.63E-03		
OCDD	3.78E-01				4.57E-03		
TeCDF Total	4.73E+00				5.72E-02		
PeCDF Total	5.28E-01				6.38E-03		
HxCDF Total	1.27E-01				1.53E-03		
HpCDF Total	3.76E-02				4.54E-04		
OCDF	1.96E-02				2.37E-04		
PCDD Total	8.37E-01				1.01E-02		
PCDF Total	5.44E+00				6.58E-02		
PCDD/PCDF Total	6.28E+00				7.59E-02		
PCDD TEQ Total			1.68E-02	1.68E-02		2.03E-04	2.03E-04
PCDF TEQ Total			4.79E-02	4.79E-02		5.78E-04	5.78E-04
PCDD/PCDF TEQ Total			6.46E-02	6.46E-02		7.81E-04	7.81E-04

Sample ID

PS-66NEW3-081315-02

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EF Total	EF TEQ	EF TEQ	EF Total	EF TEQ	EF TEQ
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Isomer.	ng/g Carbon		ng/kg fuel		
	ND = 0	ND = LOD	ND = 0	ND = LOD	
2,3,7,8 - TCDD	1.12E-04	1.12E-04	1.12E-04	4.79E-02	4.79E-02
1,2,3,7,8 - PeCDD	1.12E-04	1.12E-04	1.12E-04	4.79E-02	4.79E-02
1,2,3,4,7,8 - HxCDD	5.79E-05	5.79E-06	5.79E-06	2.47E-02	2.47E-03
1,2,3,6,7,8 - HxCDD	1.67E-04	1.67E-05	1.67E-05	7.11E-02	7.11E-03
1,2,3,7,8,9 - HxCDD	1.46E-04	1.46E-05	1.46E-05	6.24E-02	6.24E-03
1,2,3,4,6,7,8 - HpCDD	2.17E-03	2.17E-05	2.17E-05	9.24E-01	9.24E-03
1,2,3,4,6,7,8,9 - OCDD	6.44E-03	1.93E-06	1.93E-06	2.74E+00	8.23E-04
2,3,7,8 - TCDF	3.82E-03	3.82E-04	3.82E-04	1.63E+00	1.63E-01
1,2,3,7,8 - PeCDF	9.94E-04	2.98E-05	2.98E-05	4.24E-01	1.27E-02
2,3,4,7,8 - PeCDF	1.01E-03	3.02E-04	3.02E-04	4.29E-01	1.29E-01
1,2,3,4,7,8 - HxCDF	2.86E-04	2.86E-05	2.86E-05	1.22E-01	1.22E-02
1,2,3,6,7,8 - HxCDF	2.83E-04	2.83E-05	2.83E-05	1.20E-01	1.20E-02
1,2,3,7,8,9 - HxCDF	1.29E-04	1.29E-05	1.29E-05	5.51E-02	5.51E-03
2,3,4,6,7,8 - HxCDF	2.66E-04	2.66E-05	2.66E-05	1.13E-01	1.13E-02
1,2,3,4,6,7,8 - HpCDF	3.61E-04	3.61E-06	3.61E-06	1.54E-01	1.54E-03
1,2,3,4,7,8,9 - HpCDF	7.15E-05	7.15E-07	7.15E-07	3.05E-02	3.05E-04
1,2,3,4,6,7,8,9 - OCDF	3.34E-04	1.00E-07	1.00E-07	1.42E-01	4.26E-05
TeCDD Total	1.70E-03			7.22E-01	
PeCDD Total	7.90E-04			3.37E-01	
HxCDD Total	1.62E-03			6.89E-01	
HpCDD Total	3.70E-03			1.58E+00	
OCDD	6.44E-03			2.74E+00	
TeCDF Total	8.06E-02			3.43E+01	
PeCDF Total	8.99E-03			3.83E+00	
HxCDF Total	2.16E-03			9.20E-01	
HpCDF Total	6.40E-04			2.73E-01	
OCDF	3.34E-04			1.42E-01	
PCDD Total	1.42E-02			6.07E+00	
PCDF Total	9.27E-02			3.95E+01	
PCDD/PCDF Total	1.07E-01			4.56E+01	
PCDD TEQ Total	2.86E-04	2.86E-04		1.22E-01	1.22E-01
PCDF TEQ Total	8.15E-04	8.15E-04		3.47E-01	3.47E-01
PCDD/PCDF TEQ Total	1.10E-03	1.10E-03		4.69E-01	4.69E-01

980 Table B-10. PCDD/PCDF data for 100 % NEW 01.

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Sample ID	PS-100NEW-072915-01	MCE	0.944463
Sampling volume (m ³)	129.1		
Carbon sampled (g)	74.3		
Carbon sampled (mg/m ³)	575.6		

Carbon fraction 0.462

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m³ ND = 0	TEQ ng/m³ ND = 0	TEQ ng/m³ ND = LOD
2,3,7,8 - TCDD	1.14E-02		1.14E-02	1.14E-02	8.83E-05	8.83E-05	8.83E-05
1,2,3,7,8 - PeCDD	1.72E-02		1.72E-02	1.72E-02	1.33E-04	1.33E-04	1.33E-04
1,2,3,4,7,8 - HxCDD	7.80E-03		7.80E-04	7.80E-04	6.04E-05	6.04E-06	6.04E-06
1,2,3,6,7,8 - HxCDD	1.50E-02		1.50E-03	1.50E-03	1.16E-04	1.16E-05	1.16E-05
1,2,3,7,8,9 - HxCDD	1.08E-02		1.08E-03	1.08E-03	8.37E-05	8.37E-06	8.37E-06
1,2,3,4,6,7,8 - HpCDD	1.68E-01		1.68E-03	1.68E-03	1.30E-03	1.30E-05	1.30E-05
1,2,3,4,6,7,8,9 - OCDD	5.04E-01		1.51E-04	1.51E-04	3.90E-03	1.17E-06	1.17E-06
2,3,7,8 - TCDF	5.17E-01		5.17E-02	5.17E-02	4.00E-03	4.00E-04	4.00E-04
1,2,3,7,8 - PeCDF	1.29E-01		3.88E-03	3.88E-03	1.00E-03	3.01E-05	3.01E-05
2,3,4,7,8 - PeCDF	1.22E-01		3.67E-02	3.67E-02	9.47E-04	2.84E-04	2.84E-04
1,2,3,4,7,8 - HxCDF	4.28E-02		4.28E-03	4.28E-03	3.32E-04	3.32E-05	3.32E-05
1,2,3,6,7,8 - HxCDF	3.62E-02		3.62E-03	3.62E-03	2.80E-04	2.80E-05	2.80E-05
1,2,3,7,8,9 - HxCDF	1.82E-02		1.82E-03	1.82E-03	1.41E-04	1.41E-05	1.41E-05
2,3,4,6,7,8 - HxCDF	3.96E-02		3.96E-03	3.96E-03	3.07E-04	3.07E-05	3.07E-05
1,2,3,4,6,7,8 - HpCDF	5.72E-02		5.72E-04	5.72E-04	4.43E-04	4.43E-06	4.43E-06
1,2,3,4,7,8,9 - HpCDF	1.24E-02		1.24E-04	1.24E-04	9.61E-05	9.61E-07	9.61E-07
1,2,3,4,6,7,8,9 - OCDF	4.52E-02		1.36E-05	1.36E-05	3.50E-04	1.05E-07	1.05E-07
TeCDD Total	3.87E-01				3.00E-03		
PeCDD Total	2.33E-01				1.80E-03		
HxCDD Total	1.96E-01				1.52E-03		
HpCDD Total	2.91E-01				2.26E-03		
OCDD	5.04E-01				3.90E-03		
TeCDF Total	9.30E+00				7.20E-02		
PeCDF Total	1.36E+00				1.06E-02		
HxCDF Total	3.08E-01				2.39E-03		
HpCDF Total	6.96E-02				5.39E-04		
OCDF	5.04E-02				3.90E-04		
PCDD Total	1.61E+00				1.25E-02		
PCDF Total	1.11E+01				8.59E-02		
PCDD/PCDF Total	1.27E+01				9.84E-02		
PCDD TEQ Total			3.38E-02	3.38E-02		2.62E-04	2.62E-04
PCDF TEQ Total			1.07E-01	1.07E-01		8.26E-04	8.26E-04
PCDD/PCDF TEQ Total			1.40E-01	1.40E-01		1.09E-03	1.09E-03

Sample ID

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Page 2 (2)

EF Total	EF TEQ	EF TEQ	EF Total	EF TEQ	EF TEQ
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Isomer.	ng/g Carbon			ng/kg fuel		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	1.53E-04	1.53E-04	1.53E-04	7.08E-02	7.08E-02	7.08E-02
1,2,3,7,8 - PeCDD	2.31E-04	2.31E-04	2.31E-04	1.07E-01	1.07E-01	1.07E-01
1,2,3,4,7,8 - HxCDD	1.05E-04	1.05E-05	1.05E-05	4.85E-02	4.85E-03	4.85E-03
1,2,3,6,7,8 - HxCDD	2.02E-04	2.02E-05	2.02E-05	9.32E-02	9.32E-03	9.32E-03
1,2,3,7,8,9 - HxCDD	1.45E-04	1.45E-05	1.45E-05	6.71E-02	6.71E-03	6.71E-03
1,2,3,4,6,7,8 - HpCDD	2.26E-03	2.26E-05	2.26E-05	1.04E+00	1.04E-02	1.04E-02
1,2,3,4,6,7,8,9 - OCDD	6.78E-03	2.03E-06	2.03E-06	3.13E+00	9.39E-04	9.39E-04
2,3,7,8 - TCDF	6.95E-03	6.95E-04	6.95E-04	3.21E+00	3.21E-01	3.21E-01
1,2,3,7,8 - PeCDF	1.74E-03	5.22E-05	5.22E-05	8.04E-01	2.41E-02	2.41E-02
2,3,4,7,8 - PeCDF	1.64E-03	4.93E-04	4.93E-04	7.59E-01	2.28E-01	2.28E-01
1,2,3,4,7,8 - HxCDF	5.76E-04	5.76E-05	5.76E-05	2.66E-01	2.66E-02	2.66E-02
1,2,3,6,7,8 - HxCDF	4.87E-04	4.87E-05	4.87E-05	2.25E-01	2.25E-02	2.25E-02
1,2,3,7,8,9 - HxCDF	2.45E-04	2.45E-05	2.45E-05	1.13E-01	1.13E-02	1.13E-02
2,3,4,6,7,8 - HxCDF	5.33E-04	5.33E-05	5.33E-05	2.46E-01	2.46E-02	2.46E-02
1,2,3,4,6,7,8 - HpCDF	7.70E-04	7.70E-06	7.70E-06	3.55E-01	3.55E-03	3.55E-03
1,2,3,4,7,8,9 - HpCDF	1.67E-04	1.67E-06	1.67E-06	7.71E-02	7.71E-04	7.71E-04
1,2,3,4,6,7,8,9 - OCDF	6.08E-04	1.82E-07	1.82E-07	2.81E-01	8.43E-05	8.43E-05
TeCDD Total	5.21E-03			2.41E+00		
PeCDD Total	3.14E-03			1.45E+00		
HxCDD Total	2.64E-03			1.22E+00		
HpCDD Total	3.92E-03			1.81E+00		
OCDD	6.78E-03			3.13E+00		
TeCDF Total	1.25E-01			5.78E+01		
PeCDF Total	1.83E-02			8.47E+00		
HxCDF Total	4.15E-03			1.91E+00		
HpCDF Total	9.37E-04			4.33E-01		
OCDF	6.78E-04			3.13E-01		
PCDD Total	2.17E-02			1.00E+01		
PCDF Total	1.49E-01			6.89E+01		
PCDD/PCDF Total	1.71E-01			7.89E+01		
PCDD TEQ Total		4.55E-04	4.55E-04		2.10E-01	2.10E-01
PCDF TEQ Total		1.43E-03	1.43E-03		6.62E-01	6.62E-01
PCDD/PCDF TEQ Total		1.89E-03	1.89E-03		8.72E-01	8.72E-01

Table B-11. PCDD/PCDF data for 100 % NEW 02.

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Sample ID	PS-100NEW2-073115-01	MCE	0.953685
Sampling volume (m ³)	116.8		
Carbon sampled (g)	63.5		
Carbon sampled (mg/m ³)	543.6		

Carbon fraction

0.5

Isomer.	Total ng/sample	LOD	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m³	TEQ ng/m³ ND = 0	TEQ ng/m³ ND = LOD
2,3,7,8 - TCDD	1.44E-02		1.44E-02	1.44E-02	1.23E-04	1.23E-04	1.23E-04
1,2,3,7,8 - PeCDD	1.44E-02		1.44E-02	1.44E-02	1.23E-04	1.23E-04	1.23E-04
1,2,3,4,7,8 - HxCDD	3.40E-03		3.40E-04	3.40E-04	2.91E-05	2.91E-06	2.91E-06
1,2,3,6,7,8 - HxCDD	1.08E-02		1.08E-03	1.08E-03	9.25E-05	9.25E-06	9.25E-06
1,2,3,7,8,9 - HxCDD	9.00E-03		9.00E-04	9.00E-04	7.71E-05	7.71E-06	7.71E-06
1,2,3,4,6,7,8 - HpCDD	1.24E-01		1.24E-03	1.24E-03	1.06E-03	1.06E-05	1.06E-05
1,2,3,4,6,7,8,9 - OCDD	3.46E-01		1.04E-04	1.04E-04	2.96E-03	8.89E-07	8.89E-07
2,3,7,8 - TCDF	7.90E-01		7.90E-02	7.90E-02	6.76E-03	6.76E-04	6.76E-04
1,2,3,7,8 - PeCDF	2.03E-01		6.10E-03	6.10E-03	1.74E-03	5.22E-05	5.22E-05
2,3,4,7,8 - PeCDF	1.96E-01		5.89E-02	5.89E-02	1.68E-03	5.04E-04	5.04E-04
1,2,3,4,7,8 - HxCDF	5.54E-02		5.54E-03	5.54E-03	4.74E-04	4.74E-05	4.74E-05
1,2,3,6,7,8 - HxCDF	4.86E-02		4.86E-03	4.86E-03	4.16E-04	4.16E-05	4.16E-05
1,2,3,7,8,9 - HxCDF	2.12E-02		2.12E-03	2.12E-03	1.81E-04	1.81E-05	1.81E-05
2,3,4,6,7,8 - HxCDF	3.78E-02		3.78E-03	3.78E-03	3.24E-04	3.24E-05	3.24E-05
1,2,3,4,6,7,8 - HpCDF	4.14E-02		4.14E-04	4.14E-04	3.54E-04	3.54E-06	3.54E-06
1,2,3,4,7,8,9 - HpCDF	1.04E-02		1.04E-04	1.04E-04	8.90E-05	8.90E-07	8.90E-07
1,2,3,4,6,7,8,9 - OCDF	2.60E-02		7.80E-06	7.80E-06	2.23E-04	6.68E-08	6.68E-08
TeCDD Total	2.70E-01				2.31E-03		
PeCDD Total	1.07E-01				9.13E-04		
HxCDD Total	1.20E-01				1.03E-03		
HpCDD Total	2.16E-01				1.85E-03		
OCDD	3.46E-01				2.96E-03		
TeCDF Total	1.17E+01				9.98E-02		
PeCDF Total	1.92E+00				1.64E-02		
HxCDF Total	3.55E-01				3.04E-03		
HpCDF Total	7.08E-02				6.06E-04		
OCDF	2.60E-02				2.23E-04		
PCDD Total	1.06E+00				9.07E-03		
PCDF Total	1.40E+01				1.20E-01		
PCDD/PCDF Total	1.51E+01				1.29E-01		
PCDD TEQ Total			3.25E-02	3.25E-02		2.78E-04	2.78E-04
PCDF TEQ Total			1.61E-01	1.61E-01		1.38E-03	1.38E-03
PCDD/PCDF TEQ Total			1.93E-01	1.93E-01		1.65E-03	1.65E-03

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Sample ID

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EF Total	EF TEQ	EF TEQ	EF Total	EF TEQ	EF TEQ
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Isomer.	ng/g Carbon			ng/kg fuel		
	ND = 0	ND = LOD		ND = 0	ND = LOD	
2,3,7,8 - TCDD	2.27E-04	2.27E-04	2.27E-04	1.05E-01	1.05E-01	1.05E-01
1,2,3,7,8 - PeCDD	2.27E-04	2.27E-04	2.27E-04	1.05E-01	1.05E-01	1.05E-01
1,2,3,4,7,8 - HxCDD	5.35E-05	5.35E-06	5.35E-06	2.47E-02	2.47E-03	2.47E-03
1,2,3,6,7,8 - HxCDD	1.70E-04	1.70E-05	1.70E-05	7.85E-02	7.85E-03	7.85E-03
1,2,3,7,8,9 - HxCDD	1.42E-04	1.42E-05	1.42E-05	6.55E-02	6.55E-03	6.55E-03
1,2,3,4,6,7,8 - HpCDD	1.96E-03	1.96E-05	1.96E-05	9.03E-01	9.03E-03	9.03E-03
1,2,3,4,6,7,8,9 - OCDD	5.45E-03	1.64E-06	1.64E-06	2.52E+00	7.55E-04	7.55E-04
2,3,7,8 - TCDF	1.24E-02	1.24E-03	1.24E-03	5.74E+00	5.74E-01	5.74E-01
1,2,3,7,8 - PeCDF	3.20E-03	9.61E-05	9.61E-05	1.48E+00	4.44E-02	4.44E-02
2,3,4,7,8 - PeCDF	3.09E-03	9.28E-04	9.28E-04	1.43E+00	4.29E-01	4.29E-01
1,2,3,4,7,8 - HxCDF	8.73E-04	8.73E-05	8.73E-05	4.03E-01	4.03E-02	4.03E-02
1,2,3,6,7,8 - HxCDF	7.65E-04	7.65E-05	7.65E-05	3.53E-01	3.53E-02	3.53E-02
1,2,3,7,8,9 - HxCDF	3.34E-04	3.34E-05	3.34E-05	1.54E-01	1.54E-02	1.54E-02
2,3,4,6,7,8 - HxCDF	5.95E-04	5.95E-05	5.95E-05	2.75E-01	2.75E-02	2.75E-02
1,2,3,4,6,7,8 - HpCDF	6.52E-04	6.52E-06	6.52E-06	3.01E-01	3.01E-03	3.01E-03
1,2,3,4,7,8,9 - HpCDF	1.64E-04	1.64E-06	1.64E-06	7.56E-02	7.56E-04	7.56E-04
1,2,3,4,6,7,8,9 - OCDF	4.09E-04	1.23E-07	1.23E-07	1.89E-01	5.67E-05	5.67E-05
TeCDD Total	4.26E-03			1.97E+00		
PeCDD Total	1.68E-03			7.75E-01		
HxCDD Total	1.89E-03			8.74E-01		
HpCDD Total	3.40E-03			1.57E+00		
OCDD	5.45E-03			2.52E+00		
TeCDF Total	1.84E-01			8.48E+01		
PeCDF Total	3.03E-02			1.40E+01		
HxCDF Total	5.58E-03			2.58E+00		
HpCDF Total	1.12E-03			5.15E-01		
OCDF	4.09E-04			1.89E-01		
PCDD Total	1.67E-02			7.70E+00		
PCDF Total	2.21E-01			1.02E+02		
PCDD/PCDF Total	2.38E-01			1.10E+02		
PCDD TEQ Total		5.11E-04	5.11E-04		2.36E-01	2.36E-01
PCDF TEQ Total		2.53E-03	2.53E-03		1.17E+00	1.17E+00
PCDD/PCDF TEQ Total		3.04E-03	3.04E-03		1.41E+00	1.41E+00

Table B-12. PCDD/PCDF data for 100 % NEW 03.

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Sample ID	PS-100NEW3-080515-01	MCE	0.936171
Sampling volume (m ³)	107.0		
Carbon sampled (g)	66.3		
Carbon sampled (mg/m ³)	619.9		

Carbon fraction

0.46

Isomer.	Total ng/sample	LOD ng/sample	TEQ ng/sample ND = 0	TEQ ng/sample ND = LOD	Total ng/m³ ND = 0	TEQ ng/m³ ND = 0	TEQ ng/m³ ND = LOD
2,3,7,8 - TCDD	3.00E-03		3.00E-03	3.00E-03	2.80E-05	2.80E-05	2.80E-05
1,2,3,7,8 - PeCDD	6.80E-03		6.80E-03	6.80E-03	6.35E-05	6.35E-05	6.35E-05
1,2,3,4,7,8 - HxCDD	3.80E-03		3.80E-04	3.80E-04	3.55E-05	3.55E-06	3.55E-06
1,2,3,6,7,8 - HxCDD	1.00E-02		1.00E-03	1.00E-03	9.34E-05	9.34E-06	9.34E-06
1,2,3,7,8,9 - HxCDD	8.20E-03		8.20E-04	8.20E-04	7.66E-05	7.66E-06	7.66E-06
1,2,3,4,6,7,8 - HpCDD	1.43E-01		1.43E-03	1.43E-03	1.34E-03	1.34E-05	1.34E-05
1,2,3,4,6,7,8,9 - OCDD	4.40E-01		1.32E-04	1.32E-04	4.11E-03	1.23E-06	1.23E-06
2,3,7,8 - TCDF	1.45E-01		1.45E-02	1.45E-02	1.35E-03	1.35E-04	1.35E-04
1,2,3,7,8 - PeCDF	4.88E-02		1.46E-03	1.46E-03	4.56E-04	1.37E-05	1.37E-05
2,3,4,7,8 - PeCDF	4.52E-02		1.36E-02	1.36E-02	4.22E-04	1.27E-04	1.27E-04
1,2,3,4,7,8 - HxCDF	2.38E-02		2.38E-03	2.38E-03	2.22E-04	2.22E-05	2.22E-05
1,2,3,6,7,8 - HxCDF	2.22E-02		2.22E-03	2.22E-03	2.07E-04	2.07E-05	2.07E-05
1,2,3,7,8,9 - HxCDF	1.00E-02		1.00E-03	1.00E-03	9.34E-05	9.34E-06	9.34E-06
2,3,4,6,7,8 - HxCDF	1.58E-02		1.58E-03	1.58E-03	1.48E-04	1.48E-05	1.48E-05
1,2,3,4,6,7,8 - HpCDF	2.68E-02		2.68E-04	2.68E-04	2.50E-04	2.50E-06	2.50E-06
1,2,3,4,7,8,9 - HpCDF	5.60E-03		5.60E-05	5.60E-05	5.23E-05	5.23E-07	5.23E-07
1,2,3,4,6,7,8,9 - OCDF	1.86E-02		5.58E-06	5.58E-06	1.74E-04	5.21E-08	5.21E-08
TeCDD Total	1.28E-01				1.19E-03		
PeCDD Total	7.60E-02				7.10E-04		
HxCDD Total	1.10E-01				1.03E-03		
HpCDD Total	2.40E-01				2.24E-03		
OCDD	4.40E-01				4.11E-03		
TeCDF Total	4.96E+00				4.64E-02		
PeCDF Total	4.80E-01				4.48E-03		
HxCDF Total	1.55E-01				1.45E-03		
HpCDF Total	5.44E-02				5.08E-04		
OCDF	2.22E-02				2.07E-04		
PCDD Total	9.94E-01				9.29E-03		
PCDF Total	5.67E+00				5.30E-02		
PCDD/PCDF Total	6.67E+00				6.23E-02		
PCDD TEQ Total			1.36E-02	1.36E-02		1.27E-04	1.27E-04
PCDF TEQ Total			3.70E-02	3.70E-02		3.46E-04	3.46E-04
PCDD/PCDF TEQ Total			5.06E-02	5.06E-02		4.73E-04	4.73E-04

Sample ID

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(2)

EF Total	EF TEQ	EF TEQ	EF Total	EF TEQ	EF TEQ
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Isomer.	ng/g Carbon		ng/kg fuel		ND = LOD
	ND = 0	ND = LOD	ND = 0	ND = LOD	
2,3,7,8 - TCDD	4.52E-05	4.52E-05	4.52E-05	2.09E-02	2.09E-02
1,2,3,7,8 - PeCDD	1.02E-04	1.02E-04	1.02E-04	4.73E-02	4.73E-02
1,2,3,4,7,8 - HxCDD	5.73E-05	5.73E-06	5.73E-06	2.64E-02	2.64E-03
1,2,3,6,7,8 - HxCDD	1.51E-04	1.51E-05	1.51E-05	6.96E-02	6.96E-03
1,2,3,7,8,9 - HxCDD	1.24E-04	1.24E-05	1.24E-05	5.71E-02	5.71E-03
1,2,3,4,6,7,8 - HpCDD	2.16E-03	2.16E-05	2.16E-05	9.97E-01	9.97E-03
1,2,3,4,6,7,8,9 - OCDD	6.63E-03	1.99E-06	1.99E-06	3.06E+00	9.19E-04
2,3,7,8 - TCDF	2.18E-03	2.18E-04	2.18E-04	1.01E+00	1.01E-01
1,2,3,7,8 - PeCDF	7.36E-04	2.21E-05	2.21E-05	3.40E-01	1.02E-02
2,3,4,7,8 - PeCDF	6.81E-04	2.04E-04	2.04E-04	3.15E-01	9.44E-02
1,2,3,4,7,8 - HxCDF	3.59E-04	3.59E-05	3.59E-05	1.66E-01	1.66E-02
1,2,3,6,7,8 - HxCDF	3.35E-04	3.35E-05	3.35E-05	1.55E-01	1.55E-02
1,2,3,7,8,9 - HxCDF	1.51E-04	1.51E-05	1.51E-05	6.96E-02	6.96E-03
2,3,4,6,7,8 - HxCDF	2.38E-04	2.38E-05	2.38E-05	1.10E-01	1.10E-02
1,2,3,4,6,7,8 - HpCDF	4.04E-04	4.04E-06	4.04E-06	1.87E-01	1.87E-03
1,2,3,4,7,8,9 - HpCDF	8.44E-05	8.44E-07	8.44E-07	3.90E-02	3.90E-04
1,2,3,4,6,7,8,9 - OCDF	2.80E-04	8.41E-08	8.41E-08	1.29E-01	3.88E-05
TeCDD Total	1.92E-03			8.88E-01	
PeCDD Total	1.15E-03			5.29E-01	
HxCDD Total	1.66E-03			7.67E-01	
HpCDD Total	3.62E-03			1.67E+00	
OCDD	6.63E-03			3.06E+00	
TeCDF Total	7.48E-02			3.45E+01	
PeCDF Total	7.23E-03			3.34E+00	
HxCDF Total	2.34E-03			1.08E+00	
HpCDF Total	8.20E-04			3.79E-01	
OCDF	3.35E-04			1.55E-01	
PCDD Total	1.50E-02			6.92E+00	
PCDF Total	8.55E-02			3.95E+01	
PCDD/PCDF Total	1.01E-01			4.64E+01	
PCDD TEQ Total		2.04E-04	2.04E-04		9.44E-02
PCDF TEQ Total		5.58E-04	5.58E-04		2.58E-01
PCDD/PCDF TEQ Total		7.62E-04	7.62E-04		3.52E-01

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Table B-13. PCDD/PCDF data for Baseline CB/CL 05.

Sample ID	PS-CB-080315-01	MCE	0.949349	Page 1 (2)
Sampling volume (m ³)	69.2			
Carbon sampled (g)	70.7			

Carbon sampled (mg/m³) 1021.1
 Carbon fraction 0.46245

Isomer.	Total ng/sample	LOD	TEQ	TEQ	Total	TEQ	TEQ
			ng/sample ND = 0	ng/sample ND = LOD	ng/m ³	ng/m ³ ND = 0	ng/m ³ ND = LOD
2,3,7,8 - TCDD	8.00E-04		8.00E-04	8.00E-04	1.16E-05	1.16E-05	1.16E-05
1,2,3,7,8 - PeCDD	2.60E-03		2.60E-03	2.60E-03	3.75E-05	3.75E-05	3.75E-05
1,2,3,4,7,8 - HxCDD	1.60E-03		1.60E-04	1.60E-04	2.31E-05	2.31E-06	2.31E-06
1,2,3,6,7,8 - HxCDD	2.80E-03		2.80E-04	2.80E-04	4.04E-05	4.04E-06	4.04E-06
1,2,3,7,8,9 - HxCDD	2.80E-03		2.80E-04	2.80E-04	4.04E-05	4.04E-06	4.04E-06
1,2,3,4,6,7,8 - HpCDD	3.68E-02		3.68E-04	3.68E-04	5.31E-04	5.31E-06	5.31E-06
1,2,3,4,6,7,8,9 - OCDD	1.05E-01		3.14E-05	3.14E-05	1.51E-03	4.53E-07	4.53E-07
2,3,7,8 - TCDF	3.10E-02		3.10E-03	3.10E-03	4.48E-04	4.48E-05	4.48E-05
1,2,3,7,8 - PeCDF	8.00E-03		2.40E-04	2.40E-04	1.16E-04	3.47E-06	3.47E-06
2,3,4,7,8 - PeCDF	6.40E-03		1.92E-03	1.92E-03	9.24E-05	2.77E-05	2.77E-05
1,2,3,4,7,8 - HxCDF	4.60E-03		4.60E-04	4.60E-04	6.64E-05	6.64E-06	6.64E-06
1,2,3,6,7,8 - HxCDF	4.40E-03		4.40E-04	4.40E-04	6.35E-05	6.35E-06	6.35E-06
1,2,3,7,8,9 - HxCDF	2.80E-03		2.80E-04	2.80E-04	4.04E-05	4.04E-06	4.04E-06
2,3,4,6,7,8 - HxCDF	5.60E-03		5.60E-04	5.60E-04	8.09E-05	8.09E-06	8.09E-06
1,2,3,4,6,7,8 - HpCDF	1.30E-02		1.30E-04	1.30E-04	1.88E-04	1.88E-06	1.88E-06
1,2,3,4,7,8,9 - HpCDF	2.80E-03		2.80E-05	2.80E-05	4.04E-05	4.04E-07	4.04E-07
1,2,3,4,6,7,8,9 - OCDF	ND	7.70E-03	0.00E+00	2.31E-06	ND	0.00E+00	3.34E-08
TeCDD Total	7.34E-02				1.06E-03		
PeCDD Total	2.66E-02				3.84E-04		
HxCDD Total	4.44E-02				6.41E-04		
HpCDD Total	7.04E-02				1.02E-03		
OCDD	1.05E-01				1.51E-03		
TeCDF Total	3.90E-01				5.63E-03		
PeCDF Total	5.20E-02				7.51E-04		
HxCDF Total	3.96E-02				5.72E-04		
HpCDF Total	2.24E-02				3.23E-04		
OCDF	ND				ND		
PCDD Total	3.19E-01				4.61E-03		
PCDF Total	5.04E-01				7.28E-03		
PCDD/PCDF Total	8.24E-01				1.19E-02		
PCDD TEQ Total			4.52E-03	4.52E-03		6.53E-05	6.53E-05
PCDF TEQ Total			7.16E-03	7.16E-03		1.03E-04	1.03E-04
PCDD/PCDF TEQ Total			1.17E-02	1.17E-02		1.69E-04	1.69E-04

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EF Total	EF TEQ	EF TEQ	EF Total	EF TEQ	EF TEQ
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Isomer.	ng/g Carbon		ng/kg fuel		
	ND = 0	ND = LOD	ND = 0	ND = LOD	
2,3,7,8 - TCDD	1.13E-05	1.13E-05	1.13E-05	5.23E-03	5.23E-03
1,2,3,7,8 - PeCDD	3.68E-05	3.68E-05	3.68E-05	1.70E-02	1.70E-02
1,2,3,4,7,8 - HxCDD	2.26E-05	2.26E-06	2.26E-06	1.05E-02	1.05E-03
1,2,3,6,7,8 - HxCDD	3.96E-05	3.96E-06	3.96E-06	1.83E-02	1.83E-03
1,2,3,7,8,9 - HxCDD	3.96E-05	3.96E-06	3.96E-06	1.83E-02	1.83E-03
1,2,3,4,6,7,8 - HpCDD	5.20E-04	5.20E-06	5.20E-06	2.41E-01	2.41E-03
1,2,3,4,6,7,8,9 - OCDD	1.48E-03	4.44E-07	4.44E-07	6.84E-01	2.05E-04
2,3,7,8 - TCDF	4.38E-04	4.38E-05	4.38E-05	2.03E-01	2.03E-02
1,2,3,7,8 - PeCDF	1.13E-04	3.39E-06	3.39E-06	5.23E-02	1.57E-03
2,3,4,7,8 - PeCDF	9.05E-05	2.72E-05	2.72E-05	4.19E-02	1.26E-02
1,2,3,4,7,8 - HxCDF	6.51E-05	6.51E-06	6.51E-06	3.01E-02	3.01E-03
1,2,3,6,7,8 - HxCDF	6.22E-05	6.22E-06	6.22E-06	2.88E-02	2.88E-03
1,2,3,7,8,9 - HxCDF	3.96E-05	3.96E-06	3.96E-06	1.83E-02	1.83E-03
2,3,4,6,7,8 - HxCDF	7.92E-05	7.92E-06	7.92E-06	3.66E-02	3.66E-03
1,2,3,4,6,7,8 - HpCDF	1.84E-04	1.84E-06	1.84E-06	8.50E-02	8.50E-04
1,2,3,4,7,8,9 - HpCDF	3.96E-05	3.96E-07	3.96E-07	1.83E-02	1.83E-04
1,2,3,4,6,7,8,9 - OCDF	ND	0.00E+00	3.27E-08	ND	0.00E+00
TeCDD Total	1.04E-03			4.80E-01	
PeCDD Total	3.76E-04			1.74E-01	
HxCDD Total	6.28E-04			2.90E-01	
HpCDD Total	9.96E-04			4.60E-01	
OCDD	1.48E-03			6.84E-01	
TeCDF Total	5.52E-03			2.55E+00	
PeCDF Total	7.35E-04			3.40E-01	
HxCDF Total	5.60E-04			2.59E-01	
HpCDF Total	3.17E-04			1.46E-01	
OCDF	ND			ND	
PCDD Total	4.52E-03			2.09E+00	
PCDF Total	7.13E-03			3.30E+00	
PCDD/PCDF Total	1.16E-02			5.39E+00	
PCDD TEQ Total		6.39E-05	6.39E-05		2.96E-02
PCDF TEQ Total		1.01E-04	1.01E-04		4.68E-02
PCDD/PCDF TEQ Total		1.65E-04	1.65E-04		7.64E-02

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Table B-14. PAH emission factors for 0 % NEW and 32 % NEW.

Compound	0 % NEW	0 % NEW	0 % NEW	32 % NEW	32 % NEW	32 % NEW
	mg/kg MRE			mg/kg MRE		
Naphthalene	30.7	61.6	45.4	47.9	30.6	40.5
Acenaphthylene	8.4	19.2	17.0	14.3	10.3	11.2

Acenaphthene(CCC)	0.41	0.90	0.76	0.70	0.43	0.61
Fluorene	2.34	5.78	5.33	3.52	2.63	3.35
Phenanthrene	8.07	21.6	17.9	12.4	8.89	12.12
Anthracene	1.37	3.22	3.03	2.23	1.53	2.16
Fluoranthene(CCC)	1.63	4.43	3.61	2.82	2.13	2.25
Pyrene	1.09	2.93	2.57	2.34	1.59	1.78
Benzo(a)anthracene	0.55	1.81	1.42	0.97	0.60	0.90
Chrysene	0.66	2.22	1.63	1.15	0.75	1.08
Benzo(b)fluoranthene	0.38	1.19	1.15	0.70	0.43	0.57
Benzo(k)fluoranthene	0.31	1.22	0.95	0.66	0.48	0.66
Benzo(a)pyrene(CCC)	0.30	1.15	0.91	0.69	0.41	0.58
Indeno(1,2,3-cd)pyrene	0.23	0.80	0.67	0.44	0.26	0.38
Dibenz(a,h)anthracene	0.09	0.30	0.24	0.13	0.08	0.14
Benzo(ghi)perylene	0.23	0.70	0.59	0.47	0.26	0.39
SUM 16-EPA PAH	57	129	103	91	61	79

Table B-15. PAH emission factors for 66 % NEW, 100 % NEW and baseline (CB/CL 05).

Compound	66 % NEW	66 % NEW	66 % NEW	100 % NEW	100 % NEW	100 % NEW	CB/CL 05
	mg/kg MRE				mg/kg MRE		
Naphthalene	30.5	34.3	27.6	47.7	36.8	109.1	40.9
Acenaphthylene	11.7	12.1	9.63	14.3	12.2	30.1	14.5
Acenaphthene(CCC)	0.58	0.56	0.56	0.60	0.48	1.53	0.52
Fluorene	3.25	3.03	4.29	3.10	3.41	7.75	2.56
Phenanthrene	12.0	11.6	17.5	12.1	12.1	24.8	9.54
Anthracene	2.16	2.07	2.73	2.14	1.99	4.68	1.98
Fluoranthene(CCC)	2.95	2.90	2.90	2.80	2.89	5.32	3.37
Pyrene	2.17	2.17	1.86	2.33	2.02	4.41	2.97
Benzo(a)anthracene	1.11	1.07	1.10	0.99	0.92	2.15	0.88
Chrysene	1.35	1.39	1.39	1.13	1.07	2.41	0.90
Benzo(b)fluoranthene	0.75	0.77	0.78	0.54	0.65	1.38	0.46
Benzo(k)fluoranthene	0.75	0.81	0.61	0.71	0.65	1.31	0.61
Benzo(a)pyrene(CCC)	0.69	0.70	0.56	0.71	0.50	1.35	0.70
Indeno(1,2,3-cd)pyrene	0.47	0.47	0.35	0.47	0.41	0.90	0.43
Dibenz(a,h)anthracene	0.14	0.14	0.13	0.15	0.12	0.31	0.09
Benzo(ghi)perylene	0.45	0.42	0.25	0.50	0.36	0.88	0.56
SUM 16-EPA PAH	71	75	72	90	77	198	81

Table B-16. PAH TEQ emission factors for 0 % NEW and 32 % NEW.

Compound	0 % NEW	0 % NEW	0 % NEW	32 % NEW	32 % NEW	32 % NEW
	mg B[a]P TEQ/kg MRE				mg B[a]P TEQ/kg MRE	
Phenanthrene	4.04E-03	1.08E-02	8.97E-03	6.21E-03	4.45E-03	6.06E-03
Anthracene	6.83E-04	1.61E-03	1.51E-03	1.11E-03	7.65E-04	1.08E-03
Fluoranthene(CCC)	8.15E-02	2.21E-01	1.81E-01	1.41E-01	1.06E-01	1.12E-01

Pyrene	1.09E-03	2.93E-03	2.57E-03	2.34E-03	1.59E-03	1.78E-03
Benzo(a)anthracene	2.74E-03	9.07E-03	7.10E-03	4.87E-03	2.99E-03	4.49E-03
Chrysene	1.99E-02	6.66E-02	4.89E-02	3.46E-02	2.25E-02	3.25E-02
Benzo(b)fluoranthene	3.83E-02	1.19E-01	1.15E-01	7.01E-02	4.31E-02	5.71E-02
Benzo(k)fluoranthene	1.53E-02	6.10E-02	4.75E-02	3.32E-02	2.38E-02	3.28E-02
Benzo(a)pyrene(CCC)	3.05E-01	1.15E+00	9.12E-01	6.86E-01	4.14E-01	5.75E-01
Indeno(1,2,3-cd)pyrene	2.33E-02	8.00E-02	6.67E-02	4.38E-02	2.65E-02	3.75E-02
Dibenz(a,h)anthracene	9.48E-02	3.31E-01	2.61E-01	1.38E-01	8.77E-02	1.54E-01
Benzo(ghi)perylene	4.57E-03	1.40E-02	1.17E-02	9.37E-03	5.28E-03	7.78E-03
SUM 16-EPA PAH	5.91E-01	2.06E+00	1.66E+00	1.17E+00	7.39E-01	1.02E+00

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Table B-17. PAH TEQ emission factors for 66 % NEW, 100 % NEW and baseline (CB/CL 05).

Compound	66 % NEW	66 % NEW	66 % NEW	100 % NEW	100 % NEW	100 % NEW	CB/CL 05
	mg B[a]P TEQ/kg MRE			mg B[a]P TEQ/kg MRE			
Phenanthrene	6.01E-03	5.82E-03	8.74E-03	6.05E-03	6.07E-03	1.24E-02	4.77E-03
Anthracene	1.08E-03	1.04E-03	1.36E-03	1.07E-03	9.93E-04	2.34E-03	9.92E-04
Fluoranthene(CCC)	1.48E-01	1.45E-01	1.45E-01	1.40E-01	1.45E-01	2.66E-01	1.69E-01
Pyrene	2.17E-03	2.17E-03	1.86E-03	2.33E-03	2.02E-03	4.41E-03	2.97E-03
Benzo(a)anthracene	5.57E-03	5.34E-03	5.49E-03	4.94E-03	4.62E-03	1.07E-02	4.40E-03
Chrysene	4.05E-02	4.16E-02	4.16E-02	3.40E-02	3.22E-02	7.23E-02	2.69E-02
Benzo(b)fluoranthene	7.51E-02	7.70E-02	7.82E-02	5.37E-02	6.52E-02	1.38E-01	4.64E-02
Benzo(k)fluoranthene	3.77E-02	4.05E-02	3.04E-02	3.57E-02	3.24E-02	6.54E-02	3.05E-02
Benzo(a)pyrene(CCC)	6.87E-01	7.01E-01	5.58E-01	7.11E-01	5.01E-01	1.35E+00	6.96E-01
Indeno(1,2,3-cd)pyrene	4.74E-02	4.72E-02	3.48E-02	4.73E-02	4.11E-02	8.99E-02	4.33E-02
Dibenz(a,h)anthracene	1.58E-01	1.49E-01	1.48E-01	1.62E-01	1.30E-01	3.37E-01	1.00E-01
Benzo(ghi)perylene	9.09E-03	8.35E-03	4.92E-03	9.91E-03	7.16E-03	1.77E-02	1.13E-02
SUM 16-EPA PAH	1.22E+00	1.22E+00	1.06E+00	1.21E+00	9.67E-01	2.37E+00	1.14E+00

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Table B-18. PM_{2.5} and PM₁₀ emission factors for MRE tests.

Date	Matrix	EF PM _{2.5}	EF PM ₁₀
		g/kg MRE	
7/30/2015	0 % NEW	11.2	13.9
7/30/2015	0 % NEW	6.9	9.8
7/30/2015	0 % NEW	12.3	15.5
7/30/2015	0 % NEW	19.0	15.3

7/31/2015	0 % NEW	10.1	10.7
7/31/2015	0 % NEW	14.3	16.2
8/3/2015	32 % NEW	10.1	9.9
8/3/2015	32 % NEW	9.4	9.9
8/4/2015	32 % NEW	12.6	12.8
8/4/2015	32 % NEW	9.6	9.8
8/6/2015	32 % NEW	11.6	12.8
8/6/2015	32 % NEW	9.9	10.6
8/12/2015	66 % NEW	8.2	8.0
8/12/2015	66 % NEW	8.6	8.1
8/13/2015	66 % NEW	7.7	8.9
8/13/2015	66 % NEW	14.2	11.0
8/13/2015	66 % NEW	10.5	9.2
8/13/2015	66 % NEW	12.9	11.8
7/29/2015	100 % NEW	8.7	10.9
7/29/2015	100 % NEW	13.5	14.1
7/31/2015	100 % NEW	14.3	13.9
7/31/2015	100 % NEW	10.1	11.2
8/5/2015	100 % NEW	12.6	12.8
8/5/2015	100 % NEW	12.2	12.5
8/3/2015	Baseline	3.0	3.5
8/3/2015	Baseline	3.3	3.4

Table B-19. Metal emission factors for MRE tests analyzed from PM_{2.5} batch filter.^a

Date	Test	Al	Al Unc.	Si	Si Unc.	P	P Unc.	S	S Unc.	Cl	Cl Unc.	K	K Unc.	Fe	Fe Unc.	Cu	Cu Unc.	Zn	Zn Unc.
		mg/kg MRE																	
7/30/2015	0 % NEW	3.33	0.32	5.98	0.36	11.14	0.63	29.59	1.61	83.28	4.44	16.79	0.87	0.331	0.037	0.167	0.026	0.832	0.045
7/30/2015	0 % NEW	2.45	0.23	5.03	0.30	9.29	0.52	23.09	1.24	58.57	3.09	17.03	0.88	0.257	0.027	0.130	0.021	0.517	0.030
7/30/2015	0 % NEW	2.98	0.34	4.91	0.31	8.95	0.51	30.89	1.69	94.26	5.05	16.68	0.87	0.353	0.040	0.175	0.031	0.528	0.031
7/30/2015	0 % NEW	3.73	0.39	6.31	0.37	9.90	0.55	25.25	1.34	67.32	3.53	17.07	0.88	0.287	0.051	0.287	0.039	0.719	0.045
7/31/2015	0 % NEW	1.93	0.22	5.02	0.32	7.46	0.44	23.42	1.30	57.01	3.10	19.04	1.00	0.256	0.025	0.129	0.018	1.029	0.053
7/31/2015	0 % NEW	1.78	0.26	5.11	0.40	14.61	1.03	24.45	1.59	44.90	2.54	17.93	0.96	0.237	0.023	0.119	0.016	1.069	0.055
8/3/2015	32 % NEW	2.19	0.22	4.97	0.34	11.68	0.71	25.85	1.48	63.96	3.54	22.33	1.18	0.146	0.017	0.146	0.013	0.731	0.036
8/3/2015	32 % NEW	2.67	0.30	5.54	0.33	10.58	0.59	18.89	1.04	34.81	1.82	18.07	0.92	0.308	0.040	0.205	0.031	0.821	0.045
8/4/2015	32 % NEW	2.34	0.27	4.68	0.35	6.40	0.42	32.32	1.93	82.45	4.75	20.92	1.14	0.469	0.028	0.140	0.013	0.625	0.032
8/4/2015	32 % NEW	1.77	0.20	5.31	0.36	11.25	0.69	21.87	1.26	34.79	1.95	17.08	0.91	0.312	0.021	0.105	0.012	0.834	0.043
8/6/2015	32 % NEW	2.43	0.28	5.20	0.32	10.93	0.62	30.70	1.68	93.13	4.99	18.21	0.95	0.346	0.036	0.173	0.025	0.519	0.029
8/6/2015	32 % NEW	2.24	0.24	7.65	0.47	11.61	0.66	24.01	1.31	42.60	2.29	24.27	1.26	0.265	0.030	0.265	0.024	0.924	0.048
8/12/2015	66 % NEW	3.16	0.31	6.78	0.39	15.37	0.85	16.38	0.89	39.32	2.05	21.13	1.08	0.228	0.040	0.228	0.031	0.565	0.035
8/12/2015	66 % NEW	1.62	0.20	6.14	0.37	5.81	0.33	20.67	1.12	37.55	1.99	15.50	0.80	0.216	0.026	0.216	0.020	1.076	0.055
8/13/2015	66 % NEW	3.50	0.33	12.02	0.74	11.57	0.66	29.07	1.60	45.96	2.47	18.27	0.95	1.370	0.076	0.151	0.025	1.067	0.054
8/13/2015	66 % NEW	3.31	0.30	15.43	0.95	9.51	0.55	27.55	1.52	52.48	2.84	14.33	0.75	0.551	0.036	0.276	0.024	1.378	0.070
8/13/2015	66 % NEW	3.13	0.31	6.43	0.38	12.86	0.71	29.70	1.60	84.93	4.50	20.84	1.08	0.176	0.037	0.347	0.033	0.694	0.037
8/13/2015	66 % NEW	2.16	0.23	7.17	0.46	10.95	0.64	24.20	1.35	65.56	3.57	14.60	0.77	0.542	0.034	0.135	0.018	0.677	0.036
7/29/2015	100 % NEW	2.07	0.20	6.22	0.39	8.49	0.49	23.89	1.32	22.80	1.24	19.14	1.00	0.296	0.023	0.198	0.017	1.185	0.060
7/29/2015	100 % NEW	1.92	0.26	4.72	0.30	11.95	0.70	25.67	1.43	60.17	3.27	25.23	1.32	0.294	0.033	0.147	0.023	1.031	0.053
7/31/2015	NEW 100 %	3.12	0.34	6.24	0.39	8.70	0.50	27.10	1.49	82.95	4.44	21.19	1.10	0.330	0.038	0.165	0.030	1.152	0.059
7/31/2015	NEW 100 %	2.17	0.23	5.50	0.35	10.28	0.60	25.19	1.40	66.45	3.62	19.40	1.02	0.289	0.026	0.144	0.018	0.868	0.044
8/5/2015	NEW 100 %	2.52	0.28	5.71	0.36	10.41	0.60	29.90	1.65	81.82	4.42	19.99	1.05	0.335	0.035	0.335	0.028	0.840	0.045
8/5/2015	NEW	2.27	0.28	5.68	0.35	10.10	0.57	21.33	1.16	48.33	2.58	20.70	1.07	0.253	0.035	0.253	0.027	0.756	0.043

^aUnc = Uncertainty. ND = not detected. ^b Less than three times the uncertainty.

1015 Continuation of Table B-19

Date	Test	Br	Br Unc.	Na	Na Unc.	Mg	Na	Ca	Ca Unc.	Ti	Ti Unc.	V	V Unc.	Cr	Cr Unc.	Mn	Mn Unc.	mg/kg MRE	
7/30/2015	0 % NEW	2.33	0.12	8.79 ^b	3.20	0.33 ^b	0.81	0.525	0.045	0.331	0.030	0.026 ^b	0.018	0.053 ^b	0.030	0.026 ^b	0.026	0.026 ^b	0.026
7/30/2015	0 % NEW	2.19	0.11	3.83 ^b	2.29	0.64 ^b	0.61	0.512	0.036	0.103	0.021	ND	0.015	0.012 ^b	0.024	0.012 ^b	0.021		
7/30/2015	0 % NEW	1.76	0.09	7.13 ^b	4.05	0.11 ^b	1.02	ND	0.036	0.018 ^b	0.031	0.031 ^b	0.022	ND	0.036	ND	0.031		
7/30/2015	0 % NEW	2.87	0.15	6.58 ^b	3.96	0.72 ^b	1.10	0.218	0.045	0.146	0.039	ND	0.028	0.056 ^b	0.045	0.056 ^b	0.039		
7/31/2015	0 % NEW	2.32	0.12	7.11 ^b	2.73	ND	0.63	0.032 ^b	0.020	0.386	0.025	ND	0.013	ND	0.020	0.032 ^b	0.018		
7/31/2015	0 % NEW	2.37	0.12	2.10 ^b	3.92	0.36 ^b	0.83	ND	0.018	0.119	0.016	ND	0.011	ND	0.018	0.059	0.016		
8/3/2015	32 % NEW	2.34	0.12	6.28 ^b	2.72	0.44 ^b	0.56	ND	0.015	0.437	0.025	ND	0.010	ND	0.015	0.038 ^b	0.013		
8/3/2015	32 % NEW	1.95	0.10	6.41 ^b	3.07	ND	0.87	0.008 ^b	0.036	0.080 ^b	0.031	ND	0.022	ND	0.036	ND	0.031		
8/4/2015	32 % NEW	2.19	0.11	1.75 ^b	3.35	0.31 ^b	0.67	ND	0.015	0.140	0.015	0.030	0.009	ND	0.015	ND	0.013		
8/4/2015	32 % NEW	1.87	0.09	6.12 ^b	2.63	ND	0.53	ND	0.014	0.312	0.019	0.032	0.009	0.022 ^b	0.014	ND	0.012		
8/6/2015	32 % NEW	2.08	0.10	6.25 ^b	3.19	ND	0.81	0.476	0.040	0.105	0.025	ND	0.018	0.033 ^b	0.029	0.033 ^b	0.025		
8/6/2015	32 % NEW	2.24	0.11	12.25	2.98	0.79 ^b	0.68	0.083	0.024	0.117	0.021	ND	0.015	ND	0.024	0.049 ^b	0.021		
8/12/2015	66 % NEW	2.37	0.12	2.46 ^b	2.81	0.34 ^b	0.82	ND	0.035	0.022 ^b	0.031	0.059 ^b	0.022	0.051 ^b	0.035	0.070 ^b	0.031		
8/12/2015	66 % NEW	1.29	0.07	12.85	2.68	0.64 ^b	0.62	ND	0.023	0.064	0.020	0.058	0.014	0.058 ^b	0.023	0.015 ^b	0.020		
8/13/2015	66 % NEW	2.13	0.11	17.78	3.80	1.52 ^b	0.83	0.175	0.029	0.151	0.025	0.054	0.018	0.529	0.036	0.087	0.025		
8/13/2015	66 % NEW	2.34	0.12	4.96 ^b	2.89	0.14 ^b	0.71	0.146	0.024	0.082	0.021	ND	0.015	0.045 ^b	0.024	0.045 ^b	0.021		
8/13/2015	66 % NEW	3.13	0.16	5.32 ^b	3.09	0.35 ^b	0.84	0.271	0.037	0.139	0.029	0.054 ^b	0.020	0.067 ^b	0.033	0.013 ^b	0.029		
8/13/2015	66 % NEW	2.03	0.10	4.37 ^b	2.75	0.68 ^b	0.66	0.015 ^b	0.021	0.135	0.018	0.015 ^b	0.013	0.127	0.021	ND	0.018		
7/29/2015	100 % NEW	1.88	0.09	10.37	2.38	0.20 ^b	0.51	ND	0.017	0.098	0.015	ND	0.011	0.098	0.017	ND	0.015		
7/29/2015	100 % NEW	1.92	0.10	9.74 ^b	3.65	ND	0.83	ND	0.027	0.591	0.037	0.011 ^b	0.017	0.036 ^b	0.027	0.011 ^b	0.023		
7/31/2015	100 % NEW	2.30	0.12	5.19 ^b	3.80	0.82 ^b	0.97	ND	0.034	0.081 ^b	0.030	0.047 ^b	0.021	ND	0.034	0.015 ^b	0.030		
7/31/2015	100 % NEW	2.32	0.12	5.71 ^b	2.70	0.054 ^b	0.64	ND	0.021	0.144	0.018	ND	0.013	0.050 ^b	0.021	0.020 ^b	0.018		
8/5/2015	100 % NEW	2.35	0.12	5.73 ^b	3.35	ND	0.83	0.106	0.028	0.167	0.024	ND	0.017	0.053 ^b	0.028	0.022 ^b	0.024		
8/5/2015	100 % NEW	1.52	0.08	11.62	3.49	0.74 ^b	0.86	0.090 ^b	0.031	0.253	0.027	0.018 ^b	0.019	ND	0.031	0.018 ^b	0.027		

^aUnc = Uncertainty. ND = not detected. ^b Less than three times the uncertainty.

Continuation of Table B-19

Date	Test	Co	Co Unc.	Ni	Ni Unc.	Ga	Ga Unc.	Ge	Ge Unc.	As	As Unc.	Se	Se Unc.	Rb	Rb Unc	Sr	Sr Unc.
7/30/2015	0 % NEW	0.012 ^b	0.018	ND	0.015	0.012 ^b	0.015	0.012 ^b	0.015	ND	0.018	0.012 ^b	0.011	ND	0.008	ND	0.022
7/30/2015	0 % NEW	ND	0.015	ND	0.012	0.012 ^b	0.012	0.026 ^b	0.012	ND	0.015	0.012 ^b	0.009	ND	0.006	ND	0.018
7/30/2015	0 % NEW	ND	0.022	ND	0.018	ND	0.018	0.047 ^b	0.018	0.047 ^b	0.022	ND	0.013	0.031 ^b	0.013	0.031 ^b	0.027
7/30/2015	0 % NEW	0.021 ^b	0.028	0.034 ^b	0.022	0.021 ^b	0.022	0.034 ^b	0.022	0.043 ^b	0.028	ND	0.017	ND	0.011	ND	0.034
7/31/2015	0 % NEW	ND	0.013	0.010 ^b	0.010	0.010 ^b	0.010	0.010 ^b	0.010	ND	0.013	0.010 ^b	0.008	ND	0.005	ND	0.015
7/31/2015	0 % NEW	ND	0.011	ND	0.009	0.011 ^b	0.009	0.011 ^b	0.009	ND	0.011	ND	0.007	ND	0.005	ND	0.014
8/3/2015	32 % NEW	ND	0.010	0.013 ^b	0.008	0.013 ^b	0.008	0.013 ^b	0.008	ND	0.010	ND	0.006	ND	0.004	0.025 ^b	0.012
8/3/2015	32 % NEW	0.029 ^b	0.022	0.020 ^b	0.018	0.049 ^b	0.018	ND	0.018	0.029 ^b	0.022	0.008 ^b	0.013	ND	0.009	ND	0.027
8/4/2015	32 % NEW	0.014 ^b	0.009	ND	0.007	ND	0.007	ND	0.007	0.014 ^b	0.009	0.014 ^b	0.006	ND	0.004	0.014 ^b	0.011
8/4/2015	32 % NEW	0.011 ^b	0.009	ND	0.007	0.022	0.007	0.032	0.007	ND	0.009	0.011 ^b	0.005	0.032	0.005	ND	0.011
8/6/2015	32 % NEW	0.016 ^b	0.018	ND	0.014	0.046	0.014	0.046	0.014	0.033 ^b	0.018	0.046	0.011	ND	0.007	0.046 ^b	0.022
8/6/2015	32 % NEW	ND	0.015	ND	0.012	0.034 ^b	0.012	0.015 ^b	0.012	0.015 ^b	0.015	0.034	0.009	ND	0.006	0.068	0.021
8/12/2015	66 % NEW	ND	0.022	0.031 ^b	0.017	0.019 ^b	0.017	0.012 ^b	0.017	ND	0.022	0.031 ^b	0.013	0.051	0.013	0.012 ^b	0.026
8/12/2015	66 % NEW	ND	0.014	0.027 ^b	0.012	ND	0.012	0.058	0.012	ND	0.014	0.069	0.009	0.042	0.009	0.027 ^b	0.018
8/13/2015	66 % NEW	ND	0.018	0.158	0.018	ND	0.014	0.033 ^b	0.014	0.033 ^b	0.018	0.017 ^b	0.011	0.087	0.011	0.054 ^b	0.022
8/13/2015	66 % NEW	ND	0.015	0.058	0.012	0.029 ^b	0.012	0.029 ^b	0.012	ND	0.015	0.016 ^b	0.009	0.016 ^b	0.009	0.016 ^b	0.018
8/13/2015	66 % NEW	ND	0.020	ND	0.016	ND	0.016	0.041 ^b	0.016	ND	0.020	0.013 ^b	0.012	0.041	0.012	ND	0.025
8/13/2015	66 % NEW	ND	0.013	0.048	0.010	0.030 ^b	0.010	0.015 ^b	0.010	ND	0.013	ND	0.008	0.078	0.008	0.015 ^b	0.016
7/29/2015	100 % NEW	ND	0.011	0.019 ^b	0.008	0.011 ^b	0.008	0.019 ^b	0.008	ND	0.011	0.041	0.006	0.041	0.006	ND	0.013
7/29/2015	100 % NEW	0.025 ^b	0.017	0.011 ^b	0.013	ND	0.013	0.025 ^b	0.013	0.049 ^b	0.017	ND	0.010	0.060	0.010	0.011 ^b	0.020
7/31/2015	100 % NEW	ND	0.021	0.031 ^b	0.017	0.031 ^b	0.017	0.047 ^b	0.017	ND	0.021	0.031 ^b	0.013	ND	0.009	0.031 ^b	0.025
7/31/2015	100 % NEW	ND	0.013	0.011 ^b	0.010	0.020 ^b	0.010	ND	0.010	0.031 ^b	0.013	ND	0.008	ND	0.005	ND	0.016
8/5/2015	100 % NEW	ND	0.017	ND	0.014	ND	0.014	0.022 ^b	0.014	ND	0.017	0.022 ^b	0.010	ND	0.007	ND	0.021
8/5/2015	100 % NEW	ND	0.019	0.018 ^b	0.016	ND	0.016	0.008 ^b	0.016	0.022 ^b	0.019	0.004 ^b	0.012	0.018 ^b	0.012	0.004 ^b	0.023

^aUnc = Uncertainty. ND = not detected. ^b less than three times the uncertainty.

Continuation of Table B-19

Date	Test	Zr	Zr Unc.	Mo	Mo Unc.	Pd	Pd Unc.	Ag	Ag Unc. mg/kg MRE	Cd	Cd Unc.	In	In Unc.	Sn	Sn Unc.	Sb	Sb Unc.
7/30/2015	0 % NEW	ND	0.045	ND	0.078	ND	0.078	0.117 ^b	0.078	0.132 ^b	0.078	0.261 ^b	0.119	ND	0.137	ND	0.241
7/30/2015	0 % NEW	ND	0.036	0.026 ^b	0.062	0.026 ^b	0.062	ND	0.062	0.129 ^b	0.062	ND	0.095	0.184 ^b	0.115	ND	0.192
7/30/2015	0 % NEW	0.063 ^b	0.054	0.153 ^b	0.094	0.063 ^b	0.094	0.016 ^b	0.094	0.066 ^b	0.094	0.309 ^b	0.143	0.309 ^b	0.165	0.614 ^b	0.295
7/30/2015	0 % NEW	ND	0.068	0.056 ^b	0.118	ND	0.118	ND	0.118	0.043 ^b	0.163	0.218 ^b	0.180	ND	0.208	ND	0.365
7/31/2015	0 % NEW	0.042 ^b	0.031	ND	0.053	0.063 ^b	0.053	0.021 ^b	0.053	0.107 ^b	0.053	0.107 ^b	0.081	0.095 ^b	0.099	0.190 ^b	0.173
7/31/2015	0 % NEW	0.070 ^b	0.027	ND	0.048	0.118 ^b	0.048	0.036 ^b	0.048	0.059 ^b	0.048	0.107 ^b	0.073	0.237 ^b	0.084	0.130 ^b	0.151
8/3/2015	32 % NEW	ND	0.023	ND	0.040	ND	0.040	ND	0.040	ND	0.056	ND	0.061	0.094 ^b	0.071	0.259 ^b	0.138
8/3/2015	32 % NEW	0.029 ^b	0.054	ND	0.094	ND	0.094	0.057 ^b	0.094	0.029 ^b	0.094	ND	0.143	0.078 ^b	0.165	ND	0.290
8/4/2015	32 % NEW	ND	0.022	ND	0.039	0.074 ^b	0.039	ND	0.039	ND	0.054	ND	0.060	0.012 ^b	0.071	0.464	0.125
8/4/2015	32 % NEW	0.032 ^b	0.021	ND	0.037	ND	0.037	ND	0.037	ND	0.051	ND	0.057	ND	0.066	0.288 ^b	0.121
8/6/2015	32 % NEW	ND	0.043	ND	0.076	ND	0.076	ND	0.076	0.159 ^b	0.105	ND	0.116	0.235 ^b	0.133	0.331 ^b	0.238
8/6/2015	32 % NEW	0.165 ^b	0.036	ND	0.063	0.034 ^b	0.063	ND	0.063	ND	0.087	ND	0.096	ND	0.111	0.658	0.199
8/12/2015	66 % NEW	ND	0.053	ND	0.092	0.101 ^b	0.092	ND	0.092	ND	0.127	0.202 ^b	0.140	ND	0.162	0.202 ^b	0.285
8/12/2015	66 % NEW	0.042 ^b	0.035	ND	0.061	ND	0.061	0.058 ^b	0.061	ND	0.085	ND	0.093	0.427	0.108	1.767	0.195
8/13/2015	66 % NEW	ND	0.043	ND	0.076	ND	0.076	ND	0.076	0.175 ^b	0.105	0.158 ^b	0.115	ND	0.133	1.394	0.241
8/13/2015	66 % NEW	ND	0.036	ND	0.064	0.016 ^b	0.064	ND	0.064	ND	0.064	ND	0.097	0.380	0.121	1.035	0.200
8/13/2015	66 % NEW	ND	0.049	ND	0.086	0.067 ^b	0.086	0.041 ^b	0.086	0.108 ^b	0.118	ND	0.131	1.899	0.192	0.542 ^b	0.269
8/13/2015	66 % NEW	ND	0.031	0.093 ^b	0.055	ND	0.055	0.030 ^b	0.055	ND	0.076	ND	0.083	ND	0.096	1.019	0.177
7/29/2015	100 % NEW	ND	0.026	ND	0.045	ND	0.045	0.019 ^b	0.045	ND	0.062	ND	0.068	0.045 ^b	0.083	0.918	0.143
7/29/2015	100 % NEW	ND	0.040	ND	0.070	ND	0.070	ND	0.070	ND	0.097	ND	0.107	0.172 ^b	0.123	ND	0.217
7/31/2015	100 % NEW	ND	0.051	0.151 ^b	0.089	0.015 ^b	0.089	ND	0.089	ND	0.123	0.151 ^b	0.136	0.104 ^b	0.157	0.743	0.229
7/31/2015	100 % NEW	0.020 ^b	0.031	ND	0.054	0.020 ^b	0.054	ND	0.054	ND	0.075	0.040 ^b	0.083	ND	0.095	0.733	0.201
8/5/2015	100 % NEW	0.022 ^b	0.042	ND	0.073	0.086 ^b	0.073	0.106 ^b	0.073	0.106 ^b	0.101	ND	0.112	ND	0.129	0.516 ^b	0.230
8/5/2015	100% NEW	0.014 ^b	0.047	ND	0.082	ND	0.082	0.018 ^b	0.082	ND	0.113	ND	0.125	ND	0.144	0.199 ^b	0.257

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^aUnc = Uncertainty. ND = not detected. ^b less than three times the uncertainty.

Continuation of Table B-19

Date	Test	Ba	Ba Unc.	La	La Unc.	Hg	Hg Unc.	Pb	Pb Unc.	Y	Y Unc.
mg/kg MRE											
7/30/2015	0 % NEW	ND	0.108	ND	0.056	0.091	0.022	0.065	0.015	0.026 ^b	0.034
7/30/2015	0 % NEW	ND	0.086	ND	0.044	0.012 ^b	0.018	0.076	0.012	ND	0.027
7/30/2015	0 % NEW	0.461	0.134	0.137 ^b	0.072	0.031 ^b	0.027	0.078	0.018	ND	0.040
7/30/2015	0 % NEW	ND	0.163	ND	0.085	ND	0.034	0.086	0.022	ND	0.051
7/31/2015	0 % NEW	ND	0.074	ND	0.038	0.032 ^b	0.015	0.053	0.010	0.010 ^b	0.023
7/31/2015	0 % NEW	ND	0.066	ND	0.034	ND	0.014	0.070	0.009	0.011 ^b	0.021
8/3/2015	32 % NEW	ND	0.056	ND	0.029	ND	0.012	ND	0.008	0.013 ^b	0.017
8/3/2015	32 % NEW	ND	0.130	ND	0.067	ND	0.027	0.037 ^b	0.018	ND	0.040
8/4/2015	32 % NEW	ND	0.054	0.030 ^b	0.028	ND	0.011	ND	0.007	ND	0.017
8/4/2015	32 % NEW	ND	0.051	ND	0.027	ND	0.011	0.063	0.007	ND	0.016
8/6/2015	32 % NEW	ND	0.105	0.079 ^b	0.058	0.096 ^b	0.022	ND	0.014	ND	0.033
8/6/2015	32 % NEW	ND	0.087	ND	0.045	0.015 ^b	0.018	0.034 ^b	0.012	0.034 ^b	0.027
8/12/2015	66 % NEW	ND	0.127	ND	0.066	ND	0.026	0.101	0.017	ND	0.040
8/12/2015	66 % NEW	ND	0.085	0.115 ^b	0.047	0.015 ^b	0.018	0.100	0.012	ND	0.026
8/13/2015	66 % NEW	ND	0.105	0.071 ^b	0.054	ND	0.022	0.104	0.014	ND	0.033
8/13/2015	66 % NEW	ND	0.088	ND	0.046	0.016 ^b	0.018	0.117	0.012	ND	0.027
8/13/2015	66 % NEW	ND	0.118	0.108 ^b	0.065	ND	0.025	0.029 ^b	0.016	ND	0.037
8/13/2015	66 % NEW	ND	0.076	ND	0.039	ND	0.016	0.063	0.010	ND	0.024
7/29/2015	100 % NEW	ND	0.062	ND	0.032	ND	0.013	0.041	0.008	ND	0.019
7/29/2015	100 % NEW	ND	0.097	ND	0.050	ND	0.020	ND	0.013	0.011 ^b	0.030
7/31/2015	100 % NEW	ND	0.123	0.031 ^b	0.064	ND	0.025	0.120	0.017	0.047 ^b	0.038
7/31/2015	100 % NEW	ND	0.075	0.011 ^b	0.039	ND	0.016	0.020 ^b	0.010	ND	0.023
8/5/2015	100 % NEW	ND	0.101	0.031 ^b	0.052	ND	0.021	0.042	0.014	ND	0.031
8/5/2015	100 % NEW	ND	0.113	ND	0.059	ND	0.023	ND	0.016	0.014 ^b	0.035

^aUnc = Uncertainty. ND = not detected. ^bLess than three times the uncertainty.

Table B-20. VOC emission factor from open burning of 100 % NEW composite MRE material.

Compound	1		100 % NEW 2		3	
	EF	Method Detection Limit	EF	Method Detection Limit	EF	Method Detection Limit
mg/kg MRE						
Propene	222.76	0.40	266.94	1.08	368.20	0.83
Dichlorodifluoromethane (CFC-12)	0.07	0.48	ND	0.13	ND	0.10
Chloromethane	3.56	0.44	2.87	0.12	2.79	0.09
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC-114)	ND	0.55	ND	0.15	ND	0.11
Vinyl Chloride	ND	0.48	0.53	0.13	0.52	0.10
1,3-Butadiene	88.00	0.62	42.25	0.17	150.85	1.31
Bromomethane	ND	0.55	0.48	0.15	0.29	0.11
Chloroethane	ND	0.48	0.26	0.13	0.31	0.10
Ethanol	4.40	2.31	ND	0.63	5.95	0.48
Acetonitrile	11.60	0.51	11.78	0.14	14.94	0.11
Acrolein	95.11	0.48	136.69	1.31	146.64	0.99
Acetone	ND	2.24	ND	0.63	114.73	0.44
Trichlorofluoromethane	ND	0.48	ND	0.13	ND	0.10
2-Propanol (Isopropyl Alcohol)	1.98	1.21	ND	0.33	ND	0.25
Acrylonitrile	6.97	0.48	8.56	0.13	9.53	0.10
1,1-Dichloroethene	ND	0.48	ND	0.13	ND	0.10
Methylene Chloride	31.72	0.48	2.97	0.13	ND	0.10
3-Chloro-1-propene (Allyl Chloride)	ND	0.48	ND	0.13	ND	0.10
Trichlorotrifluoroethane	ND	0.48	ND	0.13	ND	0.10
Carbon Disulfide	ND	0.44	ND	0.12	ND	0.09
trans-1,2-Dichloroethene	ND	0.55	0.20	0.15	ND	0.11
1,1-Dichloroethane	ND	0.48	ND	0.13	ND	0.10
Methyl tert-Butyl Ether	ND	0.48	ND	0.13	ND	0.10
Vinyl Acetate	77.00	1.87	125.62	0.51	123.07	0.39
2-Butanone (MEK)	15.14	0.62	27.58	0.17	29.50	0.12
cis-1,2-Dichloroethene	ND	0.48	0.31	0.13	ND	0.10
Ethyl Acetate	9.53	1.03	ND	0.27	ND	0.21
n-Hexane	6.70	0.44	9.30	0.12	15.59	0.09
Chloroform	ND	0.48	0.29	0.13	ND	0.10
Tetrahydrofuran (THF)	1.69	0.59	2.97	0.15	3.22	0.12
1,2-Dichloroethane	ND	0.48	ND	0.13	ND	0.10
1,1,1-Trichloroethane	ND	0.48	ND	0.13	ND	0.10
Benzene	197.88	0.48	211.07	1.26	265.84	0.95
Carbon Tetrachloride	ND	0.44	0.03	0.12	0.01	0.09
Cyclohexane	ND	0.84	ND	0.23	0.48	0.17
1,2-Dichloropropane	ND	0.48	0.21	0.13	ND	0.10

		g/kg MRE	g/kg MRE	g/kg MRE	
Bromodichloromethane	ND	0.44	ND	0.12	ND
Trichloroethene	ND	0.40	ND	0.11	ND
1,4-Dioxane	ND	0.48	ND	0.13	ND
Methyl Methacrylate	ND	0.88	ND	0.24	ND
<i>n</i> -Heptane	8.07	0.48	8.56	0.13	13.89
cis-1,3-Dichloropropene	ND	0.40	ND	0.11	ND
4-Methyl-2-pentanone	0.88	0.48	1.20	0.13	1.95
trans-1,3-Dichloropropene	ND	0.48	ND	0.13	ND
1,1,2-Trichloroethane	ND	0.48	ND	0.13	ND
Toluene	76.85	0.48	41.45	0.13	55.42
2-Hexanone	4.40	0.48	5.02	0.13	6.35
Dibromochloromethane	ND	0.48	ND	0.13	ND
1,2-Dibromoethane	ND	0.48	ND	0.13	ND
<i>n</i> -Butyl Acetate	ND	0.48	ND	0.13	ND
<i>n</i> -Octane	5.50	0.51	6.85	0.14	10.72
Tetrachloroethene	ND	0.40	ND	0.11	ND
Chlorobenzene	ND	0.48	0.23	0.13	0.13
Ethylbenzene	20.53	0.48	8.56	0.13	14.69
<i>m</i> , <i>p</i> -Xylenes	5.50	0.88	4.45	0.23	7.15
Bromoform	ND	0.44	ND	0.12	ND
Styrene	194.34	0.44	37.69	0.12	127.04
<i>o</i> -Xylene	3.08	0.44	2.34	0.12	3.77
<i>n</i> -Nonane	4.03	0.44	5.60	0.12	8.73
1,1,2,2-Tetrachloroethane	ND	0.44	ND	0.12	ND
Cumene	1.10	0.44	0.46	0.12	0.91
alpha-Pinene	0.55	0.40	ND	0.11	0.87
<i>n</i> -Propylbenzene	1.72	0.48	1.03	0.13	1.71
4-Ethyltoluene	0.62	0.48	0.57	0.13	0.91
1,3,5-Trimethylbenzene	ND	0.48	0.33	0.13	0.67
1,2,4-Trimethylbenzene	0.70	0.44	0.69	0.12	1.79
Benzyl Chloride	ND	0.32	0.18	0.09	ND
1,3-Dichlorobenzene	ND	0.44	ND	0.12	ND
1,4-Dichlorobenzene	ND	0.40	ND	0.11	ND
1,2-Dichlorobenzene	ND	0.44	ND	0.12	ND
<i>d</i> -Limonene	0.77	0.40	0.86	0.11	1.19
1,2-Dibromo-3-chloropropane	ND	0.29	ND	0.08	ND
1,2,4-Trichlorobenzene	ND	0.48	ND	0.13	ND
Naphthalene	44.00	0.51	34.26	0.14	35.33
Hexachlorobutadiene	ND	0.40	ND	0.11	ND
Carbon Monoxide	19.78		21.62		23.69
Methane	0.89		0.52		0.83

Carbon Dioxide	1659.67	1657.77	1653.67
MCE ratio	0.980	0.979	0.977

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Table B-21. VOC emission factor from open burning of 66 % NEW composite MRE material.

Compound	66 % NEW			
	EF	Method Detection Limit		EF
		mg/kg MRE		
Propene	249.59	1.51	256.14	1.56
Dichlorodifluoromethane (CFC 12)	ND	0.09	ND	0.38
Chloromethane	1.96	0.08	4.52	0.33
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.10	ND	0.42
Vinyl Chloride	0.37	0.09	0.46	0.38
1,3-Butadiene	84.73	2.36	80.11	0.51
Bromomethane	0.22	0.10	ND	0.42
Chloroethane	0.23	0.09	ND	0.38
Ethanol	5.53	0.44	ND	1.77
Acetonitrile	6.86	0.10	10.81	0.40
Acrolein	113.98	1.81	138.88	0.38
Acetone	ND	0.41	88.12	1.73
Trichlorofluoromethane	ND	0.09	ND	0.38
2-Propanol (Isopropyl Alcohol)	ND	0.22	ND	0.93
Acrylonitrile	4.05	0.09	6.32	0.38
1,1-Dichloroethene	ND	0.09	ND	0.38
Methylene Chloride	ND	0.09	ND	0.38
3-Chloro-1-propene (Allyl Chloride)	ND	0.08	ND	0.35
Trichlorotrifluoroethane	ND	0.09	ND	0.38
Carbon Disulfide	ND	0.08	ND	0.33
trans-1,2-Dichloroethene	ND	0.10	ND	0.42
1,1-Dichloroethane	ND	0.08	ND	0.35
Methyl tert-Butyl Ether	ND	0.09	ND	0.38
Vinyl Acetate	77.36	0.35	109.62	1.43
2-Butanone (MEK)	20.00	0.11	29.64	0.46
cis-1,2-Dichloroethene	ND	0.08	ND	0.35
Ethyl Acetate	ND	0.19	ND	0.76
n-Hexane	8.21	0.08	9.82	0.33
Chloroform	0.29	0.09	ND	0.38
Tetrahydrofuran (THF)	2.51	0.11	3.04	0.46
1,2-Dichloroethane	ND	0.08	ND	0.35
1,1,1-Trichloroethane	ND	0.09	ND	0.38
Benzene	169.34	1.69	193.80	0.35
Carbon Tetrachloride	0.06	0.08	ND	0.33
Cyclohexane	ND	0.15	ND	0.63
1,2-Dichloropropane	ND	0.08	ND	0.35

Bromodichloromethane	ND	0.08	ND	0.33
Trichloroethene	ND	0.07	ND	0.31
1,4-Dioxane	ND	0.08	ND	0.35
Methyl Methacrylate	ND	0.17	ND	0.67
<i>n</i> -Heptane	7.74	0.09	12.65	0.38
cis-1,3-Dichloropropene	ND	0.07	ND	0.31
4-Methyl-2-pentanone	ND	0.08	0.67	0.35
trans-1,3-Dichloropropene	ND	0.08	ND	0.35
1,1,2-Trichloroethane	ND	0.08	ND	0.35
Toluene	40.37	0.09	63.07	0.38
2-Hexanone	3.68	0.08	6.32	0.35
Dibromochloromethane	ND	0.08	ND	0.35
1,2-Dibromoethane	ND	0.08	ND	0.35
<i>n</i> -Butyl Acetate	ND	0.08	ND	0.35
<i>n</i> -Octane	5.89	0.10	8.85	0.40
Tetrachloroethene	ND	0.07	ND	0.31
Chlorobenzene	ND	0.08	ND	0.35
Ethylbenzene	18.79	0.08	18.13	0.35
<i>m</i> , <i>p</i> -Xylenes	4.05	0.16	5.48	0.67
Bromoform	ND	0.08	ND	0.33
Styrene	187.88	1.62	231.90	0.33
<i>o</i> -Xylene	2.25	0.08	3.04	0.33
<i>n</i> -Nonane	5.16	0.08	7.17	0.33
1,1,2,2-Tetrachloroethane	ND	0.08	ND	0.33
Cumene	1.14	0.08	1.26	0.33
alpha-Pinene	0.74	0.07	1.01	0.31
<i>n</i> -Propylbenzene	1.14	0.08	1.90	0.35
4-Ethyltoluene	0.48	0.08	0.63	0.35
1,3,5-Trimethylbenzene	0.25	0.08	ND	0.35
1,2,4-Trimethylbenzene	0.70	0.08	1.01	0.33
Benzyl Chloride	0.17	0.06	ND	0.24
1,3-Dichlorobenzene	ND	0.08	ND	0.33
1,4-Dichlorobenzene	ND	0.07	ND	0.31
1,2-Dichlorobenzene	ND	0.08	ND	0.33
d-Limonene	0.66	0.07	1.26	0.31
1,2-Dibromo-3-chloropropane	ND	0.05	ND	0.22
1,2,4-Trichlorobenzene	ND	0.08	ND	0.35
Naphthalene	23.58	0.10	46.38	0.40
Hexachlorobutadiene	ND	0.07	ND	0.31
	g/kg biomass		g/kg biomass	
Carbon Monoxide	16.49		20.32	

Methane	0.46	0.58
Carbon Dioxide	1534.60	1528.24
MCE ratio	0.983	0.979

Table B-22. VOC emission factor from open burning of 32 % NEW composite MRE material.

Compound	32 % NEW					
	EF	Method Detection Limit	2		3	
			EF	Method Detection Limit	EF	Method Detection Limit
mg/kg MRE						
Propene	311.64	0.90	341.65	1.07	335.09	0.78
Dichlorodifluoromethane (CFC 12)	ND	0.11	ND	0.13	ND	0.09
Chloromethane	2.39	0.09	2.48	0.11	2.00	0.08
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.12	ND	0.14	ND	0.11
Vinyl Chloride	0.55	0.11	0.64	0.13	0.59	0.09
1,3-Butadiene	121.14	1.37	139.34	1.66	117.23	1.21
Bromomethane	0.25	0.12	0.46	0.14	0.27	0.11
Chloroethane	0.29	0.11	0.23	0.13	0.22	0.09
Ethanol	ND	0.51	ND	0.59	1.64	0.43
Acetonitrile	11.58	0.11	11.06	0.14	13.53	0.10
Acrolein	128.71	1.06	160.44	1.29	144.35	0.94
Acetone	ND	0.47	101.29	0.59	105.12	0.43
Trichlorofluoromethane	ND	0.11	ND	0.13	ND	0.09
2-Propanol (Isopropyl Alcohol)	ND	0.27	ND	0.32	ND	0.23
Acrylonitrile	6.64	0.11	7.50	0.13	7.03	0.09
1,1-Dichloroethene	ND	0.11	ND	0.13	ND	0.09
Methylene Chloride	ND	0.11	ND	0.13	ND	0.09
3-Chloro-1-propene (Allyl Chloride)	ND	0.10	ND	0.12	ND	0.09
Trichlorotrifluoroethane	ND	0.11	ND	0.13	ND	0.09
Carbon Disulfide	ND	0.09	ND	0.11	0.59	0.08
trans-1,2-Dichloroethene	0.23	0.12	0.29	0.14	ND	0.11
1,1-Dichloroethane	ND	0.10	ND	0.12	ND	0.09
Methyl tert-Butyl Ether	ND	0.11	ND	0.13	ND	0.09
Vinyl Acetate	85.97	0.39	133.98	0.49	113.33	0.36
2-Butanone (MEK)	22.00	0.13	28.03	0.16	29.03	0.12
cis-1,2-Dichloroethene	ND	0.10	ND	0.12	ND	0.09
Ethyl Acetate	ND	0.22	ND	0.27	ND	0.20
n-Hexane	11.44	0.09	11.94	0.11	13.79	0.08
Chloroform	0.25	0.11	ND	0.13	ND	0.09
Tetrahydrofuran (THF)	2.54	0.13	2.89	0.15	2.77	0.11
1,2-Dichloroethane	ND	0.10	ND	0.12	ND	0.09
1,1,1-Trichloroethane	ND	0.11	ND	0.13	ND	0.09
Benzene	257.78	1.02	262.41	1.23	277.31	0.90
Carbon Tetrachloride	0.02	0.09	0.02	0.11	0.01	0.08
Cyclohexane	ND	0.18	ND	0.22	0.51	0.16

1,2-Dichloropropane	ND	0.10	0.28	0.12	ND	0.09
Bromodichloromethane	ND	0.09	ND	0.11	ND	0.08
Trichloroethene	ND	0.09	ND	0.11	ND	0.08
1,4-Dioxane	0.25	0.10	ND	0.12	ND	0.09
Methyl Methacrylate	ND	0.20	ND	0.24	ND	0.17
n-Heptane	11.33	0.11	12.33	0.13	13.29	0.09
cis-1,3-Dichloropropene	ND	0.09	ND	0.11	ND	0.08
4-Methyl-2-pentanone	ND	0.10	ND	0.12	1.29	0.09
trans-1,3-Dichloropropene	ND	0.10	ND	0.12	ND	0.09
1,1,2-Trichloroethane	0.13	0.10	ND	0.12	ND	0.09
Toluene	62.36	0.11	52.30	0.13	120.98	0.94
2-Hexanone	4.69	0.10	5.90	0.12	6.25	0.09
Dibromochloromethane	ND	0.10	ND	0.12	ND	0.09
1,2-Dibromoethane	ND	0.10	ND	0.12	ND	0.09
<i>n</i> -Butyl Acetate	0.28	0.10	0.18	0.12	ND	0.09
<i>n</i> -Octane	8.99	0.11	9.11	0.14	10.16	0.10
Tetrachloroethene	ND	0.09	ND	0.11	ND	0.08
Chlorobenzene	ND	0.10	0.28	0.12	0.19	0.09
Ethylbenzene	20.32	0.10	12.33	0.12	39.08	0.09
<i>m</i> -, <i>p</i> -Xylenes	5.86	0.19	5.20	0.23	7.03	0.17
Bromoform	ND	0.09	ND	0.11	ND	0.08
Styrene	207.11	0.94	133.98	1.13	508.01	0.82
<i>o</i> -Xylene	3.17	0.09	2.68	0.11	3.79	0.08
<i>n</i> -Nonane	7.42	0.09	7.50	0.11	8.60	0.08
1,1,2,2-Tetrachloroethane	ND	0.09	0.13	0.11	ND	0.08
Cumene	1.37	0.09	0.70	0.11	2.46	0.08
alpha-Pinene	ND	0.09	0.91	0.11	0.70	0.08
<i>n</i> -Propylbenzene	1.76	0.10	1.23	0.12	2.27	0.09
4-Ethyltoluene	0.70	0.10	0.64	0.12	0.98	0.09
1,3,5-Trimethylbenzene	0.32	0.10	0.31	0.12	0.74	0.09
1,2,4-Trimethylbenzene	0.86	0.09	0.75	0.11	1.91	0.08
Benzyl Chloride	0.16	0.07	0.12	0.09	ND	0.06
1,3-Dichlorobenzene	ND	0.09	ND	0.11	ND	0.08
1,4-Dichlorobenzene	ND	0.09	ND	0.11	ND	0.08
1,2-Dichlorobenzene	ND	0.09	ND	0.11	ND	0.08
d-Limonene	0.70	0.09	1.07	0.11	1.17	0.08
1,2-Dibromo-3-chloropropane	ND	0.06	ND	0.08	ND	0.05
1,2,4-Trichlorobenzene	ND	0.10	ND	0.12	ND	0.09
Naphthalene	38.69	0.11	33.23	0.14	33.22	0.10
Hexachlorobutadiene	ND	0.09	ND	0.11	ND	0.08
Carbon Monoxide		g/kg biomass	g/kg biomass		g/kg biomass	
		22.87			23.98	22.87

Methane	0.82	0.70	0.82
Carbon Dioxide	1557.34	1555.91	1557.34
MCE ratio	0.976	0.975	0.976

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Table B-23. VOC emission factor from open burning of 0 % NEW composite MRE material.

Compound	0 % NEW					
	EF	Method Detection Limit	2		3	
			EF	Method Detection Limit	EF	Method Detection Limit
mg/kg MRE						
Propene	200.93	0.42	242.02	0.69	361.04	0.83
Dichlorodifluoromethane (CFC 12)	0.10	0.49	ND	0.08	ND	0.10
Chloromethane	5.12	0.45	1.42	0.08	3.06	0.09
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.56	ND	0.09	ND	0.11
Vinyl Chloride	ND	0.49	0.36	0.08	0.74	0.10
1,3-Butadiene	69.59	0.63	94.27	1.09	143.98	1.27
Bromomethane	ND	0.56	0.21	0.09	0.70	0.11
Chloroethane	ND	0.49	0.09	0.08	0.24	0.10
Ethanol	3.20	2.33	4.35	0.40	1.83	0.48
Acetonitrile	7.87	0.52	4.94	0.09	9.87	0.10
Acrolein	111.12	0.49	94.04	0.83	169.89	1.00
Acetone	ND	2.26	ND	0.40	126.09	0.44
Trichlorofluoromethane	ND	0.49	ND	0.08	ND	0.10
2-Propanol (Isopropyl Alcohol)	ND	1.22	ND	0.21	ND	0.24
Acrylonitrile	4.52	0.49	4.35	0.08	7.85	0.10
1,1-Dichloroethene	ND	0.49	ND	0.08	ND	0.10
Methylene Chloride	ND	0.49	ND	0.08	8.51	0.10
3-Chloro-1-propene (Allyl Chloride)	ND	0.45	ND	0.08	ND	0.09
Trichlorotrifluoroethane	ND	0.49	ND	0.08	ND	0.10
Carbon Disulfide	ND	0.45	31.54	0.08	ND	0.09
trans-1,2-Dichloroethene	ND	0.56	0.19	0.09	ND	0.11
1,1-Dichloroethane	ND	0.45	ND	0.08	ND	0.09
Methyl tert-Butyl Ether	ND	0.49	ND	0.08	ND	0.10
Vinyl Acetate	83.50	1.91	72.51	0.33	148.34	0.38
2-Butanone (MEK)	18.55	0.63	20.05	0.11	31.11	0.12
cis-1,2-Dichloroethene	ND	0.45	ND	0.08	ND	0.09
Ethyl Acetate	ND	1.01	ND	0.17	ND	0.21
n-Hexane	8.10	0.45	8.80	0.08	13.65	0.09
Chloroform	ND	0.49	ND	0.08	ND	0.10
Tetrahydrofuran (THF)	2.09	0.59	2.18	0.10	3.18	0.12
1,2-Dichloroethane	ND	0.45	ND	0.08	ND	0.09
1,1,1-Trichloroethane	ND	0.49	ND	0.08	ND	0.10
Benzene	135.57	0.45	188.41	0.80	309.62	0.92
Carbon Tetrachloride	ND	0.45	0.02	0.08	0.03	0.09
Cyclohexane	ND	0.84	0.30	0.15	ND	0.17

1,2-Dichloropropane	ND	0.45	0.22	0.08	ND	0.09
Bromodichloromethane	ND	0.45	ND	0.08	ND	0.09
Trichloroethene	ND	0.42	ND	0.07	ND	0.08
1,4-Dioxane	ND	0.45	0.11	0.08	ND	0.09
Methyl Methacrylate	ND	0.90	ND	0.16	ND	0.18
<i>n</i> -Heptane	8.00	0.49	9.43	0.08	13.96	0.10
cis-1,3-Dichloropropene	ND	0.42	ND	0.07	ND	0.08
4-Methyl-2-pentanone	0.63	0.45	0.65	0.08	1.09	0.09
trans-1,3-Dichloropropene	ND	0.45	ND	0.08	ND	0.09
1,1,2-Trichloroethane	ND	0.45	ND	0.08	0.09	0.09
Toluene	45.09	0.49	39.73	0.08	104.53	1.00
2-Hexanone	4.18	0.45	4.35	0.08	6.11	0.09
Dibromochloromethane	ND	0.45	ND	0.08	ND	0.09
1,2-Dibromoethane	ND	0.45	ND	0.08	ND	0.09
<i>n</i> -Butyl Acetate	ND	0.45	0.15	0.08	ND	0.09
<i>n</i> -Octane	6.26	0.52	6.89	0.09	10.03	0.10
Tetrachloroethene	ND	0.42	ND	0.07	ND	0.08
Chlorobenzene	ND	0.45	0.21	0.08	0.20	0.09
Ethylbenzene	10.09	0.45	9.06	0.08	30.10	0.09
<i>m</i> -, <i>p</i> -Xylenes	4.87	0.87	5.08	0.15	6.11	0.17
Bromoform	ND	0.45	ND	0.08	ND	0.09
Styrene	100.90	0.45	90.64	0.76	427.57	0.87
<i>o</i> -Xylene	2.57	0.45	2.36	0.08	3.05	0.09
<i>n</i> -Nonane	4.87	0.45	5.44	0.08	8.29	0.09
1,1,2,2-Tetrachloroethane	ND	0.45	ND	0.08	ND	0.09
Cumene	0.59	0.45	0.51	0.08	1.75	0.09
alpha-Pinene	1.15	0.42	0.54	0.07	ND	0.08
<i>n</i> -Propylbenzene	1.18	0.45	0.94	0.08	1.53	0.09
4-Ethyltoluene	0.59	0.45	0.54	0.08	0.74	0.09
1,3,5-Trimethylbenzene	ND	0.45	0.40	0.08	0.43	0.09
1,2,4-Trimethylbenzene	0.77	0.45	0.73	0.08	0.87	0.09
Benzyl Chloride	ND	0.32	0.14	0.05	0.24	0.07
1,3-Dichlorobenzene	ND	0.45	ND	0.08	ND	0.09
1,4-Dichlorobenzene	ND	0.42	ND	0.07	ND	0.08
1,2-Dichlorobenzene	ND	0.45	ND	0.08	ND	0.09
d-Limonene	ND	0.42	0.94	0.07	1.09	0.08
1,2-Dibromo-3-chloropropane	ND	0.29	ND	0.05	ND	0.06
1,2,4-Trichlorobenzene	ND	0.45	ND	0.08	ND	0.09
Naphthalene	32.36	0.52	30.09	0.09	43.63	0.10
Hexachlorobutadiene	ND	0.42	ND	0.07	ND	0.08
Carbon Monoxide	g/kg biomass		g/kg biomass		g/kg biomass	
	18.77		19.97		24.53	

Methane	0.66	0.62	0.77
Carbon Dioxide	1512.10	1510.32	1502.73
MCE ratio	0.980	0.979	0.974

1035 Table B-24. VOC emission factor from open burning of baseline (CB/CL).

Compound	CB/CL - baseline	
	EF	1
		Method Detection Limit
	mg/kg fiberboard	
Propene	16.70	0.06
Dichlorodifluoromethane (CFC-12)	ND	0.08
Chloromethane	1.45	0.07
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC-114)	ND	0.09
Vinyl Chloride	ND	0.08
1,3-Butadiene	5.77	0.10
Bromomethane	ND	0.09
Chloroethane	ND	0.08
Ethanol	0.38	0.36
Acetonitrile	0.56	0.08
Acrolein	13.51	0.08
Acetone	8.34	0.35
Trichlorofluoromethane	ND	0.08
2-Propanol (Isopropyl Alcohol)	ND	0.18
Acrylonitrile	0.24	0.08
1,1-Dichloroethene	ND	0.08
Methylene Chloride	0.14	0.08
3-Chloro-1-propene (Allyl Chloride)	ND	0.07
Trichlorotrifluoroethane	ND	0.08
Carbon Disulfide	1.21	0.07
trans-1,2-Dichloroethene	ND	0.09
1,1-Dichloroethane	ND	0.07
Methyl tert-Butyl Ether	ND	0.08
Vinyl Acetate	22.77	0.29
2-Butanone (MEK)	2.87	0.09
cis-1,2-Dichloroethene	ND	0.07
Ethyl Acetate	0.09	0.15
n-Hexane	0.07	0.07
Chloroform	ND	0.08
Tetrahydrofuran (THF)	0.10	0.09
1,2-Dichloroethane	ND	0.07
1,1,1-Trichloroethane	ND	0.08
Benzene	33.35	0.07
Carbon Tetrachloride	0.01	0.07
Cyclohexane	ND	0.13
1,2-Dichloropropane	ND	0.07

Bromodichloromethane	ND	0.07
Trichloroethene	ND	0.06
1,4-Dioxane	ND	0.07
Methyl Methacrylate	ND	0.14
<i>n</i> -Heptane	ND	0.08
cis-1,3-Dichloropropene	ND	0.06
4-Methyl-2-pentanone	ND	0.07
trans-1,3-Dichloropropene	ND	0.07
1,1,2-Trichloroethane	ND	0.07
Toluene	7.21	0.08
2-Hexanone	0.08	0.07
Dibromochloromethane	ND	0.07
1,2-Dibromoethane	ND	0.07
<i>n</i> -Butyl Acetate	ND	0.07
<i>n</i> -Octane	ND	0.08
Tetrachloroethene	ND	0.06
Chlorobenzene	ND	0.07
Ethylbenzene	1.02	0.07
<i>m</i> -, <i>p</i> -Xylenes	0.88	0.13
Bromoform	ND	0.07
Styrene	3.49	0.07
<i>o</i> -Xylene	0.36	0.07
<i>n</i> -Nonane	ND	0.07
1,1,2,2-Tetrachloroethane	ND	0.07
Cumene	ND	0.07
alpha-Pinene	0.08	0.06
<i>n</i> -Propylbenzene	ND	0.07
4-Ethyltoluene	0.09	0.07
1,3,5-Trimethylbenzene	ND	0.07
1,2,4-Trimethylbenzene	0.12	0.07
Benzyl Chloride	ND	0.05
1,3-Dichlorobenzene	ND	0.07
1,4-Dichlorobenzene	ND	0.06
1,2-Dichlorobenzene	ND	0.07
d-Limonene	0.10	0.06
1,2-Dibromo-3-chloropropane	ND	0.04
1,2,4-Trichlorobenzene	ND	0.07
Naphthalene	11.39	0.08
Hexachlorobutadiene	ND	0.06
g/kg fiberboard		
Carbon Monoxide	14.29	
Methane	0.13	

Carbon Dioxide	1672.84
MCE ratio	0.987



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